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An Examination of Online Qualitative Research Methods

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An Examination of Online Qualitative Research Methods in the Context of a Research Question

Goal of paper
This paper is meant as an exploration into possible approaches to answering the following research question: how are educators in the Commonwealth of Virginia integrating the Virginia Technology Standards of Learning into the day-to-day classroom learning environment and curriculum as a whole? Traditional qualitative research methods and online and technology-based qualitative methods will be explored to determine possible techniques and best approaches. Weaknesses and strengths will be outlined. Finally, the placement of these two methodological approaches – traditional and online – will be placed into the continuum of accepted research paradigms.

Introduction
Definitions of Qualitative Research
Qualitative Research is defined as a "set of interpretive practices" that does not emphasize any one methodology or practice over any other (Denzin and Lincoln, 1998). It crosses fields and disciplines. Denzin and Lincoln site the progression of Qualitative Research as historical in nature - from positivist/traditional to post-positivist to post-modern (and so much in between). They further describe the qualitative researcher as the "bricoleur" – a practitioner who uses multiple varied practices to come to a solution to a problem. This use of multiple methods results in triangulation – using different methods to provide multiple perspectives to a problem (Denzin and Lincoln, 1998). These concepts of multiple methods and synthesis of perspectives play an important role in the hypothetical research focus outlined in this paper.

Why do researchers turn to Qualitative Methods?
Further foundational establishment is accomplished by asking the question – why would a researcher turn to Qualitative Methods to answer the research question? Quantitative Research practices focus on the positivist element of research – what can be measured in terms of amount or quantity – numerical representations. Qualitative Research – while having its foundations in positivism – is concerned with the human element of social science research (Denzin and Lincoln, 1998).

The researcher then would choose qualitative approaches over quantitative if he/she has:
1. the desire to use positivist approaches in the framework of post-positivism
2. postmodernist leanings that allow for non-positivist methods of telling "a story"
3. an interest in "capturing the individual's point of view"
4. concern for "examining the everyday constraints of life"
5. an interest in "securing rich descriptions" of the research (Denzin and Lincoln, 1998).

The question outlined in the "Goal of this Paper" relies heavily upon multiple perspectives, the use of human subjects in natural environments, the use of observation of practitioners. There can be no numerical account of best practice of technology integration into classroom learning. We must use the experiences, the interests, the practices, the musings of classroom teachers, school administrators, school board members, community members and very importantly, students. These views and observation, this kind of textual data cannot be quantified. There must be an approach of integration of methodologies to truly paint the picture effectively.

This being said, it is important to determine the desired form of the outcome of this research – will it be a definitive study or will it be examples of success? Will there be generalizations drawn, commonalties identified or will there be studies on specific cases? Certainly some would argue that the outcome could be determined until one gets there – that the process is fluid often directing the researcher rather than the researcher pre-determining the process. It, however idealistic a researcher should remain, seems highly likely that the most useful outcome for this particular study would be to determine general practices- examples that could be followed. This points directly to a case study methodology. This particular Qualitative Method seems to meet the need of this researcher – open-ended and encompassing – and the rationale outlined at the forefront of this section – pointing to avoidance of simplification and emphasis on the human experience. The case satisfies the three tenets of the qualitative method: describing, understanding, and explaining. (Tellis, 1997)

Issues in Qualitative Research

A Brief Examination of the Case Study Methodology
As many quantitative researchers dismiss quantitative methodologies as not reliable research practice, there are those aligned with the qualitative camp that criticize the case study methodology. A recurring criticism of case study methodology is that due to its reliance on a single case it is impossible to make generalizations with regard to its results (Tellis, 1997). But isn't this the primary focus of the case study – not to provide hard-nosed observations that can have general applications- but rather to outline the successes and failures of specific cases to further define a research field, a set of research questions, an academic pursuit or a process? The applications of case study approaches are not for macrocosmic ventures but rather for microcosmic ones. The importance here is of the case – and only the case.

It has been pointed out that regardless of the number of cases in a study (one or a thousand), the multiple case study never becomes a macroscopic study. The importance lies in the establishment – and the adherence to – the objective of the study. The objective dictates parameters for how the study is conducted. Thus the results of the study – one case or a thousand – are acceptable under the objectives (Tellis, 1997).

Tellis outlines three applications of case study methodology – explanatory cases, knowledge-driven cases, and descriptive cases. The explanatory case is useful in determining causation in a study. He points to pattern-matching techniques as possible analytical techniques to be used. Knowledge-driven purports that ideas and findings become commercial products. Descriptive cases "require that the investigator begin with a descriptive theory, or face the possibility that problems will occur during the project." This feeds into a hypothesis of cause-and-effect relationships. (Tellis, 1997)

A Brief Examination of Internet-Based Research Practices
This paper sets out to compare and contrast the use of traditional methods with use of internet-based methods in researching a specific question. As the Internet is still in its infancy – not really reaching a "mainstream" market until the mid-1990s – there is some difficulty in verifying a method based in this medium as a verifiable and respectable approach. Coomber came across the issues of sampling, lack verification of findings and a minimal amount of expertise among sociologists in Internet optimization (Coomber, 1997). Truly, as the internet is exponentially increasing in its users and it is fluidly changing virtually monthly with its applications and practical technologies, by the time this paper is read there could likely be a new way of obtaining research data via the internet that this paper failed to conceptualize.

It will be important to outline later in this paper – in more detail – the short-comings and the inherent limitations the Internet (and the World Wide Web) present for the world of ethnographic/sociological research. But first, we must create a baseline by examining traditional methods.

Traditional Methods
Introduction
Traditional Methods – which unto itself is difficult to define as what is truly "traditional" and when is the cut-off – constitute a varying set of tools for the means of gathering relevant qualitative data. When the modernist era – and thus the Positivist-only era – drew to a close and Post-modernist thought began to make its way into the minds of the research community – qualitative practice became more of an accepted approach to research. Regardless, "Traditional" in this context means *non-internet-based*.

The primary set of methods examined here feed into the overall methodology of Case Study – the chosen path for this research question. The gamut of methods – from document-research to ethnographic field work – will be briefly examined below.

Methods
Tellis reports of multiple means of gather qualitative data in the realm of Case Study Research. These include *documents, archival records, interviews, direct observation,* and *participant-observation.* These are briefly discussed below.

Document-based and Archival Record Research
Documents constitute letters, articles, administrative documents, agendas, minutes and any other document that proves to be relevant to the research. Documents, according to Tellis, help in the "triangulation of evidence," serving as complimentary data to existing data. He further asserts that documents are useful for the purpose of making inferences about events. Archival records represent records of organizations, services, name lists and other like data. Tellis warns the researcher to be aware of a documents veracity – that a record is merely that – and can't necessarily be held as absolute *(Tellis, 1997)*

Many documents and such exist in the realm of educational research. Certainly, everything from lesson plans to reports to the local school boards can be used as relevant data in this research approach. As listed above, it is important to use this document driven data as qualitative and supporting data not as primary sources themselves.

Interviews
Interviews are obviously one of the most important means of gather case study data. Tellis lists out three forms of interviews: *Open-ended, Focused,* and *Structured* or *survey*.

The open-ended interview allows for participants to comment about a specific event or events. The openness allows the respondents to drive the discussion from thoughts to reflections to solutions. Several informants will be necessary to authenticate the data.

Tellis reports that the focused interview focuses on a specific respondent with a specific set of questions. This type of interview used for corroboration of other data. Consequently, the structured interview – like a survey - has a predetermined set of questions. These interview questions are very detailed and are carefully developed prior to the interview (Tellis, 1997). The survey method is certainly one of the most popular and easier methods to implement. Distributing a survey – in person or by mail – can be a low –impact means of gathering data – where the preparation of the survey is the intense work to be done. Certainly organizing the data upon its return can prove to be challenging as well.

Direct observation
This is the progression towards more ethnographic approaches to research – arriving on site to observe using informal or more formal tools of measurement. This method is primarily used for gathering additional information about the

subject being studied. Tellis further notes that the reliability of the data collected is further established if several observer take part in the activity (Tellis, 1997).

Participant-observation
We finally move into the methods of ethnographic enquiry. Participant-observation requires that the researcher become a part of the culture/environment being studied. The danger in this method lies in the researchers inadvertent ability to alter events while taking part (Tellis, 1997). In the case of our proposed study – this would take on the form of classroom participation as integration of technology occurs.

Focus Groups
Focus groups – popular in the academic and commercial worlds – is a discussion focused on a specific topic or subject where "group dynamics assist in data generation (Catterall and Maclaran, 1997)." The positives of this type of group discussion has been described as "as synergism, snowballing, stimulation, security, and spontaneity (Catterall and Maclaran, 1997)."

 The focus group method takes a more holistic and interpretive approach to analyzing data – as opposed to coding and counting and computer analysis. "Good" qualitative data analysis is not the face-value gathering of group data but rather a more interpretive approach – clinical in nature- examining cultural relationships and underlying themes (Catterall and Maclaran, 1997). This is clarified as not occurring in a "natural setting" – even if it is a natural setting – as it is note that few conversational are mono-topical in nature. Regardless – the value lies in how the conversation progresses and what views are exposed with what kinds of reactions (Catterall and Maclaran, 1997).

What is analyzed in focus group generated data is the pattern of discussion, the flow of discussion, and the snapshots of discussion that reveal intent and relevance.

The Benefits Inherent to Using Traditional Methods
The benefits of using traditional methods – or more specifically not using internet-based methods – are quite logically in contrast later mentioned weaknesses of using such online methods (these will be outlined below).

Dimension of Expression, Inflection, Emphasis
As will be discussed later, the visual and auditory cues are lost in textual and much electronic communication. The value of face-to-face communication is obviously greatly beneficial to the qualitative researcher. The nuances of expression and the subtleties of vocal variances make every difference in the interpretation of intent and meaning in communication analysis. Regardless of how many computer-generated symbols are used in a text-based discussion – the sacrifice must still be made in comparison to the richness contained within communication in persona.

Traditional Ethnographic Immersion
While online qualitative methods allow for near anonymous participation in online culture, the value of participating in the actual process – the sitting in a classroom, the participating in a lesson, the responding to an instruction – can not be replicated in an electronic format. The researcher's ability to observe, feel, see, hear, and touch allow for a more holistic approach to gather valuable data. This is not the case in an electronic format.

The Limitations Inherent to Using Traditional Methods
As with the online methods outlined, more traditional methods have specific limitations to their effectiveness with qualitative data gathering that online methods have proven quite effective at overcoming.

Geographical Limitations
To do a study across county lines, state lines, international borders can be quite difficult. Never before have we been able to gather information so effectively from such diverse locations. This cannot be done effectively with the more traditional methods. We must accept that travelling to locations to do research is not completely open and to be able to do these research activities from remote locations has great benefit to opening up never before seen possibilities.

Economic Limitations
As with any research – the success is dependent upon its funding – and continued funding. Traditional methods rely on compensation for subjects, travelling expenses, compensation for time spent, compensation for data transcribers, printing materials, and other unavoidable expenses. If it is possible to cut out excessive travel, costs for materials and other non-electronic materials, then we can have a very costly means of doing research – dependent upon the method chosen.

Limitations of Time
More traditional methods require time – sometimes time that the researcher does not have. In this world of progression, traditional methods maintain a rate required that can make the research process quite tedious. If it is possible to speed up a process – then it seems to be in the best interest of the research community to do so.

Online Methods

Introduction
In order to establish the means and methods of online-driven research, we must first examine the current technologies associated with online communication. Holge-Hazelton observes that "internet communication is a written quasi that has the potential to use the strengths of both conversation and writing, and since the 'feel' of it is oral, it has been called "multiloguing."" (Holge-Hazelton, 2002) This

creates a style of communication completely unique. Patsy Clarke splits divides the current forums for communications into two primary groupings – asynchronous and synchronous.

Asynchronous communication includes the following technologies:

- Email: for text message communication and file attachments. Can be text based, 'pushed' to the user's email box or web-based and 'pulled' from a web page interface. Suitable for one-on-one online interviews.
- Email list(servs): uses list-processing software and distributes email to all subscribed users on the list. Can be text based or web-based with threaded topics. Optional screening of messages by moderator. Suitable for online focus groups and online observation.
- UseNet/News groups: for topic based discussions. Require a newsgroup server to temporarily store information for access by users. Suitable for online focus groups and online observation. (Clarke, Internet)

Synchronous communication includes the following technologies:

- Internet Relay Chat (IRC) channels. Usually real-time, interactive, text-based discussion system delivered via a networked computer chat server. Can be used for interviews, focus groups, and online observation.
- Multi-User Dungeons/Domains (MUDs) and MUD Object-Oriented (MOOs). Traditionally used as gaming environments, they have the potential to set up virtual "places" to facilitate collaboration. (Evard, 1993; Harrison, 1997). Suitable for online participant observation (Turkle, 1998). (Clarke, Internet)

This author would add online form surveys into the asynchronous group as it is a means of one-on-one communication – albeit one way.

As the research question above is focused on a specific topic – directly related to the field of Education – the MUDs forum would not be applicable. These are helpful in understanding the users in an ethnographical/ sociological fashion – studying behaviors and interaction – but as we are focused on thoughts concerning integration of technologies into education we must avoid these divergences.

This paper will examine the uses of Email, Listservs, UseNet groups, IRC, and Online Polls/ Surveys. There are other emerging technologies (on a daily basis) that would also be appropriate to examine in this research context – however due to the internet's rapid evolution there is not enough literature supporting or elaborating on their implementations. This would be a need - to constantly explore the methods in relation to emerging technologies.

What the researcher must determine upon entering the data gathering phase is the appropriateness of the chosen methodology. Many online methods greatly aid the researcher in practice – but not all are assistive and rather can prove to be prohibitive. The research questions sets the parameters of the process and the direction of choosing methods. There must be a better understanding of the strengths and weaknesses of specific online methods in order to best make this judgment. Herein lies of review of these known and observed strengths and weaknesses.

Methods

As new technologies and forms of communication arise, new research practices can be utilized to gather data. Currently, the internet and internet-based technologies prove to be an emerging means of effectively gathering qualitative data for the purposes of research. Several of these methods will be discussed below.

News Groups

News groups are areas for users to post text-based messages, images, or files against a specific topic or range of topics. The area is merely a listing of links to created documents with the poster and the time it was posted. The postings are organized in a reverse-chronological sorting. News Groups are often organized around celebrities (fans), types of games, hobbies, movies, television shows, topics of interest and shared views.

Certainly, the implications of using News Groups for this research question should be clear. The area of interest can be created for users to post against and examples of integration, ideas, comments, complaints, discussions and concerns can be easily gathered from this well of data storage. News Groups can be monitored twenty-four hours a day.

Any users can post against any News Groups provided his/her Internet service provider has access to that News Group.

List Servs

List Servs – as similar to News Groups – function around a specific topic or range of topics. Users subscribe to a list based on a specific topic or interest. Once subscribed, users receive emails from others in the group. Each time a participant responds, all subscribers in the group receive the email response. The discussion is basically emailed to the entire group – as if everyone was sitting in the same room listening and contributing.

This method creates quite a data set – easily accessible by the researcher. It is possible that some users will receive messages and not read them – thus not really participating – but a discussion among interested parties is effectively documented. Truly, only individuals who would want to participate would

subscribe as – noted above – no one would casually want a multitude of emails filling his/her inbox of the email client.

Within the context of Qualitative Research methods, this particular method provides the great data return with the likelihood of willing and interested participants.

Clarke reports that Gaiser used this method to conduct focus group interviews. Participants were recruited from existing listserv groups (after permission was obtained from email list group managers). Special email lists were then created and a time span of one week was used to hold the discussion – "structured with a topic guide and an introductory exercise to set the tone of the context and what would follow (Clarke, Internet)."

Clifford (as reported by Stubbs, 1998) has described email-based discussion groups as a form of "anthropological fieldwork."

Online Polls/ Surveys
Online polls and online surveys provide a direct method for submitting solicited data over the Internet. Simple (or complex) questions with choices of answers (or open-ended) are provided to the user/surfer. Each question can then be ticked or typed according to type and submitted. Answers can be emailed directly to a recipient or stored and organized into a database for easy retrieval. Data can be pulled from the database in browser-based interface for compiling the data or as raw data in a delimited text file to be drawn into a piece of software.

Variations of this actual method can be created using a PDF (portable document format) file – created by Adobe – that allows a user to electronically fill out a downloaded and formatted survey to be emailed or mailed to the recipient. Microsoft also has similar functionality in its Office products.

Simple polls can be created on a site to provide for minute number of questions and an immediate display of the results up to that point.

Chat Groups
Bowker notes that "users of IRC treat the medium as a virtual reality of virtual freedom, in which participants feel free to act out their fantasies, to challenge social norms, and exercise aspects of their personality that would under normal circumstances be inhibited (Bowker, 2001)." Chat rooms allow the free expression and discussion of individuals. User must download a Chat Client Software in order to participate. Discussion occurs in real time – obviously across cultural and geographical boundaries. The only limitation to the Chat is the technological limitation of the user and possibly language barriers (international or cyber-based).

The Benefits Inherent to Using Online Methods
Accurate Technical Scripting
One of the most obvious strengths of most online methods is that it by design provides an accurate technical scripting of discussions as all data is already fixed in an accurate textual format. This data can then be generally converted to pure unformatted data and then pulled into any software (from word processing/ spreadsheet/ database software to qualitative research data analysis software). This raw data can be of use in saving a researcher time (not having to transcribe) and then for it to be ready to be pulled into analysis software means it can be electronically formatted for the researcher's use. Manual recording of dialogue is no longer necessary as an exhaustive accounting of discussions exist in an easily manipulated form.

Technical scripting can be further expounded into data collection and management. One of the great internet-based technologies – specifically a scripting language geared towards data management – is the much acclaimed Extensible Mark-up Language (XML). The beauty of this format is that XML can be shared across multiple formats. As Carmichael explains, "(a) collection of data stored as XML can be used for simple retrieval; can be extended into a code-and-retrieve system in which data is retrieved on the basis of code content; and can ultimately be developed into a conceptual mapping tool in which data is presented in either a structured-text or graphical form using a data visualtion tool." Carmichael further describes the "Learning to Learn" project where a piece of functionality collects transcripts of teachers' and learners' classroom discourse and publishes them to the web to be searchable by practitioners and researchers alike. The plan is to allow coding to be added easily so as to help in characterizing the data. "The XML-based approach adopted in the project allows this progression to take place without the need for users to adopt new software." (Carmichael, 2002)

Access to Users: Geographically and Temporally
Stubbs observes that this "debate takes on a new significance in the context of wider discussions about globalisation processes which appear to compress both time and space, themselves, at least in part, social constructs" (Stubbs, 1998). This research work is being done on the Commonwealth of Virginia and it's education community. A diverse global community is not necessary – nor desired – for the scope of this project. But as the Commonwealth has a population of seven million residents with a public school population of 1.1 million students in 132 school divisions (Spar, 2001) it is important to examine this issue. The southwest of Virginia with it's coal mines and blue collar population to northern Virginia with it's white collar high-tech industry is as diverse as comparing two unrelated countries. Cultural and economic differences are obvious. It is equally important to examine the Tidewater region that is so influenced by the economics of the Chesapeake Bay as well as Southside Virginia with its reliance on agriculture. All four of these regions are also different from the Shenandoah Valley and the mountainous regions to the west. How to

gather information from such different locations becomes an interesting quandary. It would be irresponsible to generalize based upon one of these populations and further – very logistically difficult to gather the intense and necessary data to accomplish the task set forth. Online methodology becomes a viable solution to this problem.

Both Hammon and Glaiser have pointed to this benefit specifically while doing their work in online focus groups and chat rooms. Specifically these include the following;

- Online groups provide a naturalistic setting for studying group dynamics in cyberspace,
- Diversity of group membership resulted from recruitment from various locations globally,
- Members of email interest groups understood how the communication technology worked,
- A more substantial time span for interviewing was possible than with face-to-face groups,
- Access to a considerable pool of potential interviewees,
- Access to respondents twenty four hours a day regardless of his location,
- No physical interviewer effects or setting effects on the interview outcomes (Clarke, Internet).

Stewart and Mann expound upon this by listing the multiple locations accessible via internet technologies that otherwise would be closed geographically:

- wide geographical access
- hard to reach populations
- closed site access (accessing sites which have closed or limited access like hospitals, religious communities, prisons, etc)
- sensitive accounts
- access to dangerous or politically sensitive sites
- resistance accounts (allows resistance to status quo "without excessive risk")
- interest groups (like chat rooms and mailing lists online)
- education, business and help services online
- support groups
- outsider accounts (for sensitive social discussions like gay and lesbian, etc)
- playground (online gaming) (Mann and Stewart, 2000)

Reaching Diverse Populations
Coomber's research on drug adulteration and distribution accessed data from difficult to reach sources. Dealers in international cities accessed a web survey through Internet cafes and such to provide information regarding drug

adulteration on the streets. He really couldn't have reached that population or gained the same data other than through the web (Clarke, Internet).

Through the use of email lists and chat it is possible to create virtual groups that enable members to gather across distances to exchange ideas. These virtual groups provide the kind of identification and feeling of membership found in face-to-face interaction and many groups identify themselves as). Participant observation of their group dynamics is easily enabled either through 'lurking' or disclosed participation.   Diversity can be obtained by setting up purposeful online groups inviting participants from a range of groups, geographical locations and across national boundaries. (Clarke, Internet)

Stewart and Mann cite five other benefits in this area
-    participant friendly (logistical problems of meeting times and places are removed)
-    conducive to easy dialogue (accessible to the every day writer)
-    testing ideas (good for testing ideas and sharpen arguments in informal environment)
-    safe environment (communicate in "familiar and physically safe environment")
-    extending the research population (can initiate internet use with non-users) (Mann and Stewart, 2000)

These touch on the ideas of virtual community building – just beginning to be explored in the research world. Brown observes that the online interview method makes it "much easier to retain links with existing participants allowing for longitudinal or follow up studies to become a real possibility as do extended conversations during which conversations are shared amongst a group of individuals over a period of time." (Brown, 2002)

Cost Effective Research
Stewart, Eckermann and Zhou argued that the online exchange between subjects internationally in their study established a great example for "future cost-effective, cross-cultural research." (Clarke, Internet) It is obvious that not having to globe trot (or even state trot) cuts down on the need for high funding.

Several practical and economic benefits are cited by Clarke.
-    Recruitment is easily negotiated through email
-    Reduced travel, venue and transcribing costs;
-    Reduced need for synchronous interview times;
-    Access costs reduced by reading and composing interactions off-line;
-    Easy communication storage and archiving;
-    Ease of distribution of discourse interpretations to participants for evaluation; and
-    Ease of publishing and updating results online.(Clarke, Internet)

Eliminating Transcription Bias
Obviously if there is an electronic means of gathering and maintaining the raw data from collection sessions, then the dangers of misunderstanding, human transcription errors and bias in general are essentially diminished. Further, this implies that it is much easier to handle and store data electronically than in a hard copy context. (Mann and Stewart, 2000)

A different type of Relationship
Another unusual benefit to internet-based qualitative data gathering is what Holge-Hazerton observed. "The relationship developed on-line can become strong and personal in a very short time, thus some participants can become very involved in online interviews if they are committed to the subject of the research for personal or social reasons" (Holege-Hazerton, 2002) This observation is directly related to work done online with individuals in the diabetes community. This idea of online community and the dynamics associated will need to be further explored as obviously the traditional rules of "community" cannot be neatly applied.

The Limitations Inherent to Using Online Methods
Regardless of the multitude of positive aspects to internet-driven research methods, there do exist weaknesses outlined as a result of previous studies done using online focus groups, listservs and email. As Roberts and Wilson point out, ""the philosophy underpinning information and communication technology (ICT) is not wholly compatible with that which underpins qualitative research. ICT is based largely on logical, objective and quantifiable procedures wheras qualitative research requires a more subjective, interpretive stance and seeks to explore meaning. On this understanding of the philosophies involved it is argued that the role of computer software in qualitative data analysis is limited."" (Roberts and Wilson, 2002). This can be carried to online methods. We must recognize these inherent limitations in these tools and methods.

Sampling Issues
As Clarke points out – it is necessary to recognize issues with proper sampling. It is highly possible – and less easy to monitor the existence thereof – that biases may well exist – certainly when examining discussions in certain discussion groups. Further complications arise from participants disappearing as quickly as they arrive – thus making interviewee follow-up nearly impossible. Demographic compositions of online discussion groups are rarely known – unless individuals are specifically invited to join in. "Lurkers" are highly likely to be present thus having many individuals in attendance with a much smaller percentage actually participating. This is further made complex by individuals easily being able to conceal true identities – whatever pseudonyms or email address can be used for multiple identities (Clarke, Internet). Clarke further notes that the anonymity of online communication lends itself to "flaming" – or the sending of negative/insulting messages (Clarke, Internet). This comfort level may be

bringing out true thoughts or be encouraging an uninhibitive nature that is not representative of true natural communication.

Currently the internet is limited to access from a portion of countries – and in the case of this particular study, a portion of counties. Residentially speaking – the common users of the internet and eMail are "relatively young, relatively well educated, read or speak some English, and are overwhelmingly male (Stubbs, 1998)."

Another issue contained within the umbrella issue of sampling is the culture of the Internet itself. As typing can be time-consuming, frequent internet users have create a language unto themselves with accepted abbreviations and symbols making casual conversation possible in a speedier fashion. This is a difficulty for the researcher to learn and understand this new language and for all participants in the discussion as well (Clarke, Internet). The sample of the proposed research is not primarily limited to internet-savvy individuals but rather teachers integrating technology. This could create a natural communication barrier between the "Haves" and the "Have-nots" (Mann and Stewart, 2000). – or more accurately stated, the "In-the-knows" and the "Know-nots."

Actual data on the appropriateness of sampling online is scarce, due primarily to a lack of expertise among the research community concerning online technologies. Coomber does note that Fisher, in a study of online users, determined that "lurkers" could come across messages, post against them, and really hold no stake or interest in them to begin with. They used LISTSERVs and News Groups to target specific groups and individuals to avoid this seemingly chaotic variable (Coomber, 1997).

Issues of Gender-Based Behavioral Tendencies
Furthering difference affecting proper sampling, differences among men and women need to be taken into consideration when researching using internet-based technologies. It has been found that men and women communicate quite differently on the internet. Note the comparisons outlined below as gathered by Patsy Clarke.

Men	Women
- Longer and more messages	- Shorter and fewer messages
- Strong assertions	- Attenuated assertions
- Self promotion or indicates status	- Apologies
- More rhetorical questions	- More questions
- More justifications	- More attenuation and
- More humour and sarcasm	supportiveness, agreement and
- More adversariality and aggressive	inclusion
language	- Present more opinions
- Less likely to change their opinion	- Rapport-making
- More coarse /abusive language	- Fewer flames, avoid conflict even

- Report-giving - More flames - More emphasis on issues and task - Ignore some posters	leaving group - More focus on maintenance and socio-emotional processes, networking, community and family contact - More emoticons (graphic accents) - orientation Notice when posters are ignored

 (Clarke, Internet)

These are further supported by Stubbs who noted that "the female users were less participatory than their male counterparts, and often silent" noting parallelism displaying patterns of a patriarchal society (Stubbs, 1998).

Clarke further notes that in gender-mixed online groups, the minority gender adapts its style of communication to that of the majority and that there exists a more equal interchange in communication when synchronous style communication is in effect (Clarke, Internet).

Missing Cues in Online Communication
As it is accepted that only a small portion of our actual communication is carried through the actual words chosen to convey thoughts and that much of our communication of ideas is carried through non-verbal cues, herein lies another limitation of online research.

Clarke lists out the communicative concepts that only sound cues and visual cues can convey - found only in face-to-face communication. These include:

Sound cues	Visual cues
- Pausing and reflection; - Emotion; - Speed, loudness and pitch; - Age and gender; - National, ethnic or class accents.	- Appearance, height and weight; - Clothes, make-up, jewelry; - Gender, age, ethnic group; - Physical handicaps; - Facial expressions; - Eye contact; - Body language and gestures; - Psychophysical responses e.g. blushing, yawning, blinking; and Emotions.

 (Clarke, Internet)

Certainly the above mentioned communication cues cannot be replicated online. As mentioned previously, a language/culture has arisen among the online community where some of these ideas can be breached online in text-based communication. For example – LOL means "laugh out loud" and is used to convey the idea of finding something very humorous. However, to the extent of

humor invoked or whether the individual was just being polite cannot be determined accurately in such a text-based forum.

Technological Limitations
Technology will fail. This fact must be accepted as an absolute. With this comes the loss of data, the lack of ability to access discussions, the loss of participation and the loss of flow and momentum. If messages are not received or ideas lose their sequence in a discussion – then simply put – the integrity of the data suffers (Clarke, Internet). As time moves on, the likelihood of stability should naturally increase – but the idea of technological reliability needs to be taken into consideration nonetheless.

As mentioned above, access to technologies becomes a serious issue in the area of technological limitations. Even News Groups are dependent upon the choices of the local access providers. As the geographical target of this research spans a state, it must be considered whether all participants will have access to the internet, to a browser that can support the functionality required, to a News Group being utilized, or even to a computer system capable of running these technologies effectively. The lowest-technologically-adept user will need to be considered the target audience.

Examining gathered data has at times even caused the researcher to merely orint out everything any way and deal with it in more traditional methods. (Ford, Oberski, and Higgins, 2000) This certainly can be attributed to the human need to avoid merely reading from a screen.

Difficulty in Monitoring
Finally, one difficulty that may arise – dependent upon the technology being used – is the difficulty in monitoring a discussion. Discussions can and will become twenty four hour a day discussions. Dependent upon the size of the group participating and the geographical disparity contained – it is possible that participants could be posting against discussions all day and all night.

Computer Literacy of the Researcher
Finally, it is vital to point out that there must be a recognition of the research community, and the particular researcher in this case, that the researchers are limited in understanding by the tools that are wielded. The researcher needs to be actuely aware of the processes, functions and trends of the technology being used. Furthermore, the researcher needs to be familiar with the user-side as well – understanding how participants are enabled and prohibited from participating by the tool (Mann and Stewart, 2000).

Researchers will have to grow accept the new technologies and then embrace the new methods involved. Bourdon makes a comparison with the changes researches would have to adopt to what he observed clerical staff going through at the advent of more advanced word processing software. He observed that

clerical staff would be aware of advanced word processors but would still go through the process of typing identical letters to different individuals separately – thus doubling and tripling the work. Using an advanced word processor could allow for a "mail merge" where the letter is typed once and then merged with data to produce the individual correspondences. To adopt these new methods, the clerical staff had to go through an acceptance period - "only then (when new convivial methods had been introduced), as familiarity and trust developed, the attitude of making the computer do a larger part of the work, albeit a significantly different way from what was usual, could come about." He further observed that – specifically in reference to researchers now - "the influence software can have on the analysis process is either seen as mildly positive with regard to its time saving potential or as a threat to some kind of methodological purity, distancing the researcher from the data - or imposing some rigid and foreign framework on the analytic process." (Bourdon, 2002)

The Plan and Conclusions
In order to conclude this paper, we must return to the goal outlined in the beginning this undertaking:

> This paper is meant as an exploration into possible approaches to answering the following research question: how are educators in the Commonwealth of Virginia integrating the Virginia Technology Standards of Learning into the day-to-day classroom learning environment and curriculum as a whole? Traditional qualitative research methods and online and technology-based qualitative methods will be explored to determine possible techniques and best approaches. Weaknesses and strengths will be outlined. Finally, the placement of these two methodological approaches – traditional and online – will be placed into the continuum of accepted research paradigms (see above)

How should a researcher approach this question of classroom-technology integration as required by the SOLs of Virginia? What research tools could the researcher use to best answer this question? We must examine the needs of the question to answer these.

Firstly, as a Case Study approach has been determined as the output, it must be established that this study would not result in generalizable conclusions. The case study would be just that – a specific study of a specific case (or set of cases). This research project would require the infiltration into a classroom environment – at least one – that was implementing the SOL technology standards into regular classroom instruction. The data gleaned would be techniques, tasks, recommendations, methods, lesson plans, teacher reflections, student reflections, parental reflections, administrator reflections, and community observations. It would be necessary to touch on multiple individuals to access all of the data surrounding the classroom.

The data gathered would need to be then compiled and patterns would need to be sought. Coding of the data would be necessary. Once patterns are identified, then cultural, geographic, racial, sociological, economic, political, curricular and other factors would need to be considered. These would need to be gathered from a reliable set of sources.

The data gathered could be compared for validity and consistency. Finally, the report would be compiled on the classroom/ school/ community.

The approach appears to necessitate a combination of approaches – an approach that is in nature, triangulation. Bowker observed that the strengths in using multiple approaches lies in integrating "the researcher's and the participants' own situated knowledge, rather than reducing understandings to single, monolithic frameworks (Bowker, 2001)." Many of the above outlined methods are quite complimentary as opposed to contradictory.

The use observed-participation and other interviews in gathering data from the classroom teacher and the students of that classroom seem invaluable. It is very possible to do less formal interviews with other teachers and community members – maybe in the form of a survey – online or otherwise. Certainly the online survey would speed up the data compiling.

As we begin to verify data, the collection of lesson plans, school policies, curriculum guides, published reports and other documents concerning the school would be invaluable. We could then compare the documents with the observed and gathered practices outlined.

An online discussion initiated for a specific period of time of invited students, teachers, community members, etc would bring about a greater understanding of the expectations of the different levels of the community and would further verify survey and interview data.

It is important to note that the approaches are meant to be supportive and that the use of online methods is meant to speed up the overall process of gathering data without sacrificing the overall integrity of the data gathered. But it must be further noted that the research community as a whole will need to examine the impact of online methods on research practice.

Fielding and Lee observe that "an underlying worry must remain . . . to what extent will the advent of computers change the craft of social research in unanticipated ways? Is the computer, as some writers have suggested, a genie in the bottle which, once released, will transform the activity of field research in unnoticed and unwelcome ways?" (Fielding and Lee, 1993) They further point to John Siedel's observations - while referencing the advent of recording devices into the world of ethnographic study - that "some researchers have been almost transfixed by recording devices, so that they come to define their research

settings and their theoretical interests in society as a whole in terms of these devices." (Fielding and Lee, 1993) Implications arise here where these devices might restrict access of the researcher to certain parts of the world but it also points to the danger of shaping research design to technological feasibility. The research community will need to keep an introspective perspective when considering the advent of new technologies into the research arena. Michael Agar – after using the qualitative data analysis program ETHNOGRAPH to produce a data report in an incorrect fashion because it could – observed that "a program like the ETHNOGRAPH represents a part of an ethnographic research process. When the part is taken for the whole, you get a pathological metonym that can lead you to the right answer for the wrong question" (Fielding and Lee, 1993)

So how do we avoid such serious issues as corrupting research design for the sake of technological convenience or innovation? Miles and Huberman have argued that qualitative research designs cannot be just be "off-the-shelf" solutions. "They need to be developed in relation to the problem at hand and are subject to modification and customization as the research proceeds" (Fielding and Lee, 1998)   The process of research decision-making will need to follow its course – where the researcher asks the question, looks at the limitations, decides on approach, methodology and then methods. Only at the last stage does the decision to use internet-based methods verses more traditional methods become the consideration.

As Bourdon observes, "we would . . . suggest that the full impact of software on qualitative methodology is yet to be seen, at least in sociology, and that the familiarization phase is still going on for most users" (Bourdon, 2002) We need to constantly look at the use of Chat Rooms and Online Forms in the framework of the current critiques of current accepted methods – while maintaining a balance of open-mindedness for new methods to the same ends. Surely a great challenge is arising.

As Tellis points out, case studies are "multi-perspectival analyses" and that it is essentially known as a" triangulated research strategy" (Tellis, 1997).   It is the conclusion here that a multi-method integrated approach can be used to further the understanding of this research query. Without such a multi-method approach – then the limitations of internet-based research methods noted above – lack of identity or control, etc may be come determents to valuable data.

Resources

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