# Teaching Qualitative Data Analysis Software (QDAS) in a Virtual Environment: Team Curriculum Development of an NVivo Training Workshop

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As Qualitative Data Analysis Software (QDAS) has entered the qualitative research scene over the last decade, the issue of delivery of training for the new tools has arisen. Online environments, as structured by Learning Management Systems (LMS), offer a delivery system that can be widely accessed by researchers around the world, but raise new issues for instructors as one tries to teach one kind of software application within another. This paper describes the way one team of experienced QDAS users collaborated on a curriculum development project to create a high quality training program for NVivo software within a Blackboard course container, examining the challenges that arose from: multiple perspectives of team members; technological challenges; and challenges to conceptualizing QDAS-based qualitative research. QDAS and online environments will inevitably be part of the qualitative research arena, and this paper takes a step toward deepening understanding of the issues present at their intersection.

The story of the development of the QDAS Webinar weaves back and forth between institutional and instructional issues.
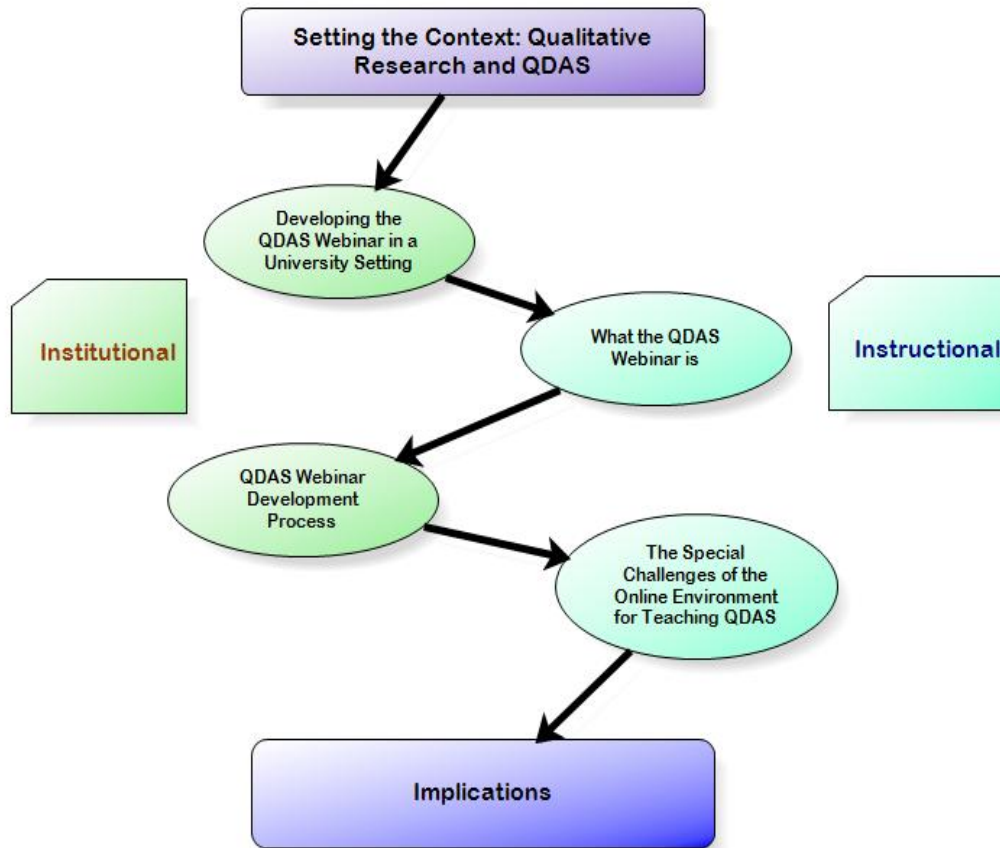
Setting the Context: Qualitative Research and QDAS

Qualitative research, alternatively referred to as non-numerical data analysis, has long had an anti-technological bias. It is not clear how this came to be. It might be related to its' anthropological roots in which early members of the field, European and American researchers, set off to study primitive cultures, where technologies were sometimes fire sticks, spears, or cooking pots. It might be related to its' sociological roots, in which researchers investigated the abuses of the industrial age and its technologies, such as Jacob Riis compelling photographs of poor immigrant families in New York City (Riis, 1971). It might be related to the ongoing debate between qualitative and quantitative paradigms, in which the quantitative paradigm has often appeared to have the upper hand, not only because of its fast and flashy statistics, but the related computer technology such as SPSS, that makes fast crunching of numbers possible.

For whatever reason, qualitative researchers have, until recently, been fairly avoidant of the use of the computer technologies developed to support non-numerical data analysis. Referred to as Qualitative Data Analysis Software, or QDAS, this class of software provides the researcher with an electronic container in which s/he can organize all materials related to the project, tools for indexing the various kinds of texts contained in the project, and that allow the research to "think Boolean," that is, to search, juxtapose and intersect the various pieces of tagged text to assist him or her in the many layered process of building interpretation of non-numerical data.

The E-Project, as this electronic container has been labeled, is a revolutionary development for qualitative researchers for two important reasons. First, it provides transparency to the research process, and second, it makes the entire research project portable. Consequences of this transformation are that the E-Project can now be viewed as more than a storage bin but as a research genre, through which researchers communicate with one another and represent their findings to the world. As a genre, the E-Project becomes something that someone authors and someone reads, and this requires standards to which the world of qualitative research agrees (diGregorio & Davidson, 2008).

The unique possibilities and challenges of QDAS are just becoming visible to qualitative researchers as the generations shift and a new era of researchers, with greater computer comfort, comes to the fore. As a consequence, in the field of qualitative research there is increased need for basic knowledge of QDAS packages and increased need for access to the skills, knowledge, and experience of experienced QDAS users. This second issue—access to the knowledge of experienced QDAS users is particularly important, but often overlooked. Many beginning QDAS users can get started on their own but without further training or support will be unable to use the software package at the higher or more complex levels. Consequently, many users, lacking support, try, fail, and go back to manual methods. The desire for QDAS information is rising in multiple fields in which qualitative research is practiced (meaning any discipline in which non-numerical data analysis is a knowledge creation technique). Just as qualitative research is practiced in countries around the globe, so, too, the need for QDAS information is global in nature.

The need for QDAS information comes at a time when new digital technologies allow for the wide reach of technology through online instruction. Although we lack hard figures, we have been following this arena closely for some time and we have observed that while online teaching exploded across many fields, online offerings in qualitative research seemed to lag behind other topics. It was not unusual for us to hear qualitative researchers say that it would be very hard to teach their subject in this format. The availability of QDAS instruction online was, thus, even further behind in this area, and until the last year there was very little available outside of the digital tutorials provided in the package by the software developers.

These were critical understandings that led to the development of the webinar that is the focus of this paper. The goal of the *Webinars with Blended Online Technologies: Radicalizing Instruction for Qualitative Research Methodology* project was to employ a suite of new technologies to develop cutting-edge teaching strategies for the delivery of advanced qualitative research methodological training. The curriculum materials and webinar format were developed by a team of consultants sponsored by the UMass-Lowell's Qualitative Research Network (UML-QRN) and working in concert with the UMass-Lowell Media Center, Continuing and Corporate Education Program, and the Faculty Development Center to insure that the format would have viability and could be disseminated to a wider audience.

In the next section, we will describe the institutional pieces that came together to make this development possible.

Developing an NVivo Webinar in a University Setting: Starting Points for a Signature Area

The context of experience is a critical aspect of qualitative research. Therefore, as qualitative researchers we felt it important to include a discussion of the context of its development within a university setting. The development of the NVivo Webinar Project is the result of several years of grassroots efforts within the University of Massachusetts Lowell qualitative research community. These patiently persistent efforts laid the groundwork for our efforts by identifying our constituencies, inviting participation and aligning our efforts with institutional needs, by building networks of support and discovering and responding to critical needs, and by recognizing the importance and power of partnerships. This fostered a fertile environment for development.

Laying the groundwork

The early efforts and initiatives of the University of Massachusetts Lowell Qualitative Research Network played an integral role in laying the groundwork for later projects, such as the development of the NVivo Webinar Project. The Qualitative Research Network is a grassroots community of researchers including faculty, staff and students who are engaged and interested in qualitative research. The QRN holds open meetings, hosts outside speakers, and strives to be a collective voice for identifying institutional needs and advocating for support for qualitative research on the UMass Lowell Campus. With a continuously growing membership, one of the greatest strengths of this group is that it crosses the traditional divisions of academic disciplines within a university setting and engages researchers in a collective interdisciplinary dialogue that focuses on methodology. Therefore, the membership of this group is not limited to one department which not only strengthens the group's voice, but also deepens the group's expertise as it draws from multiple disciplines and perspectives.

Building Networks of Support

As the access, availability, awareness and use of Qualitative Data Analysis Software (QDAS) continued to grow in the field of Qualitative Research, the Qualitative Research Network at UMass Lowell recognized the need for institutional support. On a very basic level, this required obtaining a site-license for software to support scholarly research. On an operational level, this required promoting the use of QDAS to support qualitative research and developing expertise to support the use of the software that integrated both knowledge of technology and an understanding of qualitative research methodologies. The QRN worked with the UMass Lowell administration and secured the funding for a site-license for NVivo. This gave the UMass Lowell qualitative research community one hundred "seats" or available licenses for use. The decision was made to have a number of these "seats" installed in computer labs that could be used for trainings or in Qualitative Research classes. This would maximize the availability of the software to the UMass community. This was only the beginning.

Judith Davidson in the Graduate School of Education was one of the first within the UMass Lowell Research Community to fully integrate QDAS into the Qualitative Research course required for doctoral students who planned on conducting qualitative research projects as their dissertation studies. This course served as an incubator for growing expertise that would later revolutionize the campus and redefine expectations for

rigor and quality in qualitative research. It was with participants in this course that the initial NVivo users group developed and from which the NVivo Training Cadre was later born. This end-users group was primarily composed of doctoral students who were learning both qualitative research and NVivo Software as they developed and fine-tuned their own dissertation studies. While the largest number of participants in this group emerged from the Graduate School of Education, there were a number of participants from other departments, including faculty who wanted to learn more about this possibilities with this new technology.

The NVivo users group hosted monthly meetings and served as a forum for members to share their projects including their struggles and lessons learned. This was an opportunity to see projects in all stages of a research study and also gave researchers an opportunity to receive feedback and suggestions from others who were also engaged in research supported by technology. While many participants in the users group were working on independent research projects, during the meetings, most felt as if they were working with a team of research consultants who helped navigated the complexities of qualitative research and the ways technology supported their work.

In addition to the growing attendance and participation in the user groups, there was also an influx of requests from students, faculty and staff who wanted to learn more about the software and the ways it could be used to support their own scholarly research. Once again, institutional needs were emerging. The NVivo Training Cadre, which was made up of early members of the users group and Davidson's Qualitative Research classes, all of whom had developed an expertise with NVivo, created and developed "NVivo Tasters." These "tasters" were one-on-one sessions with faculty to give them a personalized one hour session that introduce them to the ways that NVivo could be used to support their research projects. The Training Cadre also began to develop NVivo Training Workshops that would address the growing needs on our campus. Like many grassroots efforts, the early work required both patience and persistence, however, once the momentum was gained, success bred success and required attention be given not only to supporting the initiative but also to sustain it.

Discovering Critical Needs

Acquiring a NVivo site-license expanded access to QDAS among UMass-Lowell researchers and graduate students, providing an opportunity to develop and grow a level of expertise with NVivo within our qualitative research community. As the expertise continued to grow, so did the demand for support which at this point was mostly on a volunteer basis. The group struggled with issues of sustainability and recognized that increasing the shared expertise "knowledge capital" is both an investment and fuel for continued efforts.

The NVivo Training Cadre continued to work collaboratively under Davidson's direction and developed and delivered three two-day workshops. The curriculum guides for these workshops were developed by Cynthia Jacobs, a member of the training cadre and a doctoral student and research assistant in the Graduate School of Education, who had formerly worked in software training. These efforts were possible within the UMass Lowell community because of the access to computer labs which were equipped with the software, and a critical mass-a community of researchers (students and faculty) engaged in scholarly work.

These trainings were extremely successful as illustrated by the wait lists that were established for each of these training as well as the positive feedback and continued requests for ongoing support that resulted from trainings. Not only were requests for training emerging from within our campus community, we were also receiving them from researchers at other colleges and universities. Once again, critical needs were emerging. Indeed, the needs for training and support from within our campus community seemed almost insatiable.

Fertile Environment for Development

A university community can be a fertile environment for development of new research intiatives, and this was our experience at UMass Lowell. On our campus we were able to bring together a diverse community of researchers with a shared interest-qualitative research. We were able to lobby for and obtain institutional support for a site-license. We had access to computer labs and researchers who were actively engaged in qualitative research. We had authentic research studies in which to test NVivo for robustness and functionality and from which to develop a level of expertise one can only obtain through experience. We had the challenge of securing funding within fiscally challenging times. However, we also had opportunities to grow and to develop ideas in an entrepreneurial way by forging partnerships within the world of academia founded on the principles of scholarly work and the world of academia that thrives on the idea of education as business enterprise.

The idea of the NVivo Webinar emerged in the fertile environment of our university community. It was driven by both the critical and growing need for training within and beyond the borders of our research community and the need to generate consistent funding to support the sustainability of our grassroots research community. The NVivo Webinar would begin to feed the insatiable need for QDAS training we had uncovered and would also provide a revenue stream to support qualitative research efforts on our campus. This idea emerged into a solid plan and was supported by an initial grant from the University of Massachusetts President's Office. In addition, our group understood that we would need to forge partnerships with those on our campus who understood the world of academia as an educational enterprise. For this we looked to our *Division of Continuing Studies, Corporate and Distance Education*, who have long been recognized for leaders in innovation and the delivery of customized high quality corporate and online education. Working within a university setting not only gave us access to this group, but made a partnership mutually beneficial. This group would be responsible for the marketing of the NVivo Webinar and it would be delivered and supported by their online program. We would develop the curriculum.

A university community may be a fertile environment for the development of ideas; however it is not an environment that is free from institutional challenges. In the initial stages of development we explored the possibility of the NVivo Webinar being offered as a "for credit course." The traditional academic divisions such as disciplines and departments that the qualitative research network was able to cross in many of the interdisciplinary initiatives were not as easy to cross when it came to offering a course. A course needs to be approved and offered through a particular department. What department would house such course? Who would teach it? How would a five week Webinar fit into a faculty work load? How many credits would be granted for such a

course? Ultimately, it was decided that the NVivo Webinar would be offered as a non-credit course.

The UMass Lowell Community also offered great opportunities to field test and to gain feedback on the development of the NVivo Webinar. Once the curriculum was developed, and the course was created using multiple mediums of technology to deliver the training, qualitative research classes were invited to use our Webinar to compliment the course which gave students and faculty access to cutting edge training materials and gave the NVivo Webinar developers feedback from participants who would be very similar to those who would later register for the online NVivo Webinar when it was completed and ready for production.

Like qualitative research, initiating an NVivo Webinar Project within a university community has been both complex and challenging. However, in retrospect, it is clear that within this context, we were able to lay the groundwork for our efforts by identifying our constituency, inviting participation and aligning our efforts with institutional needs, by building networks of support and discovering and responding to critical needs, and by recognizing the importance and power of partnerships. In the end, we have chartered new territory with the merger developing QDAS trainings to demonstrate the power of technology as a tool to support the rigor of scholarly research and the development of trainings to establish revenue to support and sustain qualitative research efforts on our campus.

The NVivo Webinar

The NVivo Webinar is structured to use the most current and effective technology available for delivering a course that aimed to blend instruction that supported the development of the skills and abilities to use technology to support qualitative research within the context of qualitative research methodology. Most of the curriculum developers already had gained experience from developing and conducting other courses online and their experience coupled with best practices in online course design were used.

Course Organization

The course is structured as a five-week asynchronous course, thus students need to pace themselves to get through the material. They are required to obtain a license for NVivo 7 or 8 so that they can practice using the software for their own projects as well as for class exercises; the Webinar contains information for how to obtain a license. There are two chat sessions scheduled after week two and week four to give the students a chance to ask questions and discuss how their own research can benefit from the lessons learned.

The course content is organized into two parts: 1) organizing data and entering it into NVivo; and 2) retrieving and analyzing data. Each part has several lessons in it specifically designed to demonstrate aspects of the software and how it can support qualitative research. The chats are aligned with two points in the curriculum, at the end of each part, giving students some idea of the pacing suggested through the Webinar.

In Part I, Organizing and Entering Data, the lessons are structured to introduce the student to the software. It is assumed that all students are familiar with qualitative research techniques, so only QDAS-related terminology is explained. Topics covered here are the basic functions, such as setting up a new project and saving projects; coding

documents; entering cases, attributes, and links; and modeling data in a graphical schema. By learning how to set up a project correctly and enter and import data, the student will be able to review and analyze the data more easily.

In Part II, Retrieving and Analyzing Data, students learn more advanced features of the software. Topics covered here include using text searches, queries, matrices and relationships. These are the features that make researchers more productive and effective in reaching conclusions about their study. While the software does not "find" the conclusions, it speeds the researcher's processing of data and various views of the data so that conclusions can be found and defended more confidently.

To illustrate the use of NVivo, five case-studies are shared. These case studies were written based upon the curriculum developers' own successful research projects. These cases use a variety of approaches to qualitative research and utilize different techniques within the software and are reviewed at the mid-point and end of the course to give "real-life" flavor to the Webinar.

To reinforce the lessons presented, students are given exercises to try on their own using a carefully designed learning project. There are two assignments that students are asked to submit to the instructor for review via the Webinar online mailbox. Students will build an outline (a "shell") for their own research project that they will share with other students. By sharing projects, students get to see other ways of organizing projects and give and gain feedback.

With the release of NVivo 8 in April 2008, we had the added challenge of updating our Webinar from its original NVivo 7 multimedia illustrations to the newer NVivo 8 version. We have also added material to the Webinar related to NVivo 8's expanded capacities in the handling of visual and audio data.

Webinar Development Process – Key Issues and Team Collaboration

Setting Boundaries

One of our initial tasks in the development of the webinar was to set the goals, objectives and focus of the webinar. Defining what the webinar is and what the webinar is not was extremely important to us in setting boundaries. Drawing from our lessons learned from our experiences with our early initiatives, the "tasters" and on campus, face-to-face trainings, we knew we had to clearly delineate the boundaries of the webinar by developing guidelines and expectations for the webinar. For example, the focus of the webinar is to teach the software as a tool for qualitative research design, and not appropriate for obtaining consultant assistance. The webinar teaches participants about the intricacies of the NVivo software package, and the principles for designing qualitative research in an electronic package. When participants complete the course they will have a thorough understanding of all technical features of NVivo, understand a meta-framework for research design in qualitative research software, and be able to apply skilled design principles to the use of NVivo software.

Working within a research focused academic institution, it is also important to recognize the expertise of the development team. Our institution is not in the software training business and the core of curriculum developers are not software trainers. Our expertise lies in using such robust software in the design of qualitative research. It was this which drove us to identify the core structure of the webinar.

The Business Plan

The for-profit model of this webinar required a business plan to be developed. Once again, we relied on the expertise of the administrators within Continuing Studies and Corporate Education. We had to provide assurances that our business model could be self-supporting while also providing adequate resources for marketing, QRN, and the instructor of the webinar sessions. Writing our business plan required us to solidify our ideas, concepts and expectations of the webinar.

To assure forward momentum on webinar development, the business plan and initial stages of webinar content development occurred in parallel. The foundation of the webinar is an NVivo workbook which was developed by one of the curriculum development team members and was used extensively as a resource as part of the face-to-face on campus sessions. Having this existing resource allowed the editorial team to begin the extensive process of editing the text based manual into a more appropriate format for online delivery. Simultaneous development also began on writing the cases and narration of the video lessons.

The Curriculum Development Team

From the initial conception of the NVivo webinar concept, there was input and collaboration from a team of core individuals, including faculty, doctoral students and post-doctoral students. As Collins (2001) advises, one important criterion for success is to "get the right people on the bus". The development team has technical and substantive experience in the areas of qualitative research, NVivo, the Blackboard Learning Management System, Camtasia and online education. Important to the success of the team collaboration was the recognition of the collective expertise. All members of the development and instructional team have used the NVivo software as researchers. Most members of the development team have also been involved in the development of and/or teaching of multiple sessions of face-to-face NVivo workshops on campus.

The team is fortunate to be able to work with the University of Massachusetts Lowell Division of Continuing Studies and Corporate Education. The Division has a history of innovation with their international recognition of the Plastics Seminars, award winning online education programs and other signature seminars. However, the traditional models of corporate outreach and partnering with business and industry have been formed primarily using traditional academic models of face-to-face instruction.

We are now seeing a new model emerging where partnerships are being formed with faculty members who have niche areas of expertise which are fostering creative ideas about how to reach out to potential, untapped audiences around the world. Such models of instruction allow us to reach an audience we might have not been able to reach using traditional on-campus instructional methods. Having access to synchronous and asynchronous technology tools has allowed us to be creative as to best position the NVivo webinar to meet the needs of our audience.

Challenge and Promise of the Online Environment for QDAS Instruction

In the years since Kaczynski & Kelly (2004) wrote about their experiences developing a hybrid upper level qualitative data analysis course, it appears that few have followed the trail they cleared. While the demand for online QDAS training would seem to call for far more such courses (for the many reasons discussed earlier), evidently the challenges inherent have kept many from responding. Some of the difficulties faced in

2004 have waned. Perhaps two changes are most notable. Online coursework has proliferated, increasing available support and easing the transition to the medium for both instructors and students. Particular to QDAS, and NVivo specifically, from both student and instructor perspectives, the modification of file structure in more recent versions of NVivo makes project sharing far simpler.

In undertaking the development of this webinar, we have faced several challenges that will be familiar to the online pioneers who preceded us. Some of these will be familiar to instructors in all media, as problems that have simply followed us from the classroom into this new environment. We have also encountered what we believe to be very promising aspects of the online QDAS training environment. We will address three areas of particular challenge and promise here: nesting technologies, pacing, and responsiveness.

Nesting Technologies

As described above, our webinar was developed to present instruction in developing qualitative research projects in NVivo (version 7 or 8). Blackboard provided the instructional interface. These two layers of technology are visible to students; that is, they must learn to navigate Blackboard in order to learn to navigate NVivo. Nested between these layers, and largely invisible to students, was a video editing tool, Camtasia, which allowed us to create animated, voice-narrated instructional video modules providing demonstration and explanation of basic NVivo functions.

Meeting the challenge of embedding these technologies allowed us to add a medium that is familiar and comfortable for students through which they could experience the unfamiliar NVivo interface. While we have not eliminated the need for students to engage with "two software programs" (Kaczynski & Kelly, 2004, p. 8) – the learning management system (LMS) and NVivo – we suspect that time will have eased the transition to the LMS for most students. As instructors, by employing additional software tools invisible to the student, we believe have increased the benefit of the online environment.

Pacing

As developers of the webinar, we may have voluntarily increased the burden of the course-pacing challenge by attempting to serve a very broad audience: undergraduate, masters and doctoral level students, faculty, individuals in non-academic settings, experienced and novice researchers, the uninitiated as well as those with some experience with NVivo.

In this context, the power of the embedded instructional video and text-based components are increased, perhaps even beyond what a live presentation could offer. In the self-paced online environment, students have the ability to play back small portions of the demonstration, to return to them as they become relevant, and to ignore portions of video or text unless and until they answer a question the student is ready to form.

This aspect of pacing is valuable from a theoretical, constructivist point of view, but an experienced instructor can attest that technology training is a learning environment where the challenge of pacing to meet varied students' needs is accentuated. While more experienced or technologically confident students can quietly work ahead on their own in the classroom (or play solitaire), perhaps assuaging their own frustration, the instructor

remains frustrated in being able to meet the needs of these students. Meanwhile, anxiety builds in those students struggling to keep up with a seatmate or instructor. The self-paced environment allows for a far wider range of pacing than a classroom permits. However, the online self-paced environment may yet fail to adequately serve the student who struggles with technology (who may indeed be undone by the need to "learn two software programs") and the most advanced student (who may rapidly complete the materials provided and be left with limited access to an instructor for higher level questions).

The latter problem – of the advanced student who is left dissatisfied as a training customer - may be the more significant. If we seek through the creation of opportunities like Kaczynski's third methods course or this webinar to increase capacity and the meaningful use of the software for scholarly purpose, to move forward the qualitative research process, then it is important that such courses meet more advanced students and take them forward.

Responsiveness

This raises the third area of challenge and promise, which is the ability to respond to spoken or unspoken needs of students. The classroom environment provides not only the opportunity to respond to the raised hand, but also the cues of eye movement, posture, facial expression and other signs of anxiety, frustration, perplexity, and insight. Where, from a constructivist view, it is so important that a student be cognitively positioned to take in new information, the classroom offers the opportunity for overheard and informal conversation that can be used by an instructor to shape information in order to plant seedlings rather than seeds of thought.

Weighed against this cost of the online environment is a benefit. Instructors may not need to rely so heavily on unspoken cues to the extent that students feel more comfortable to voice questions, frustrations and ideas through email or chat sessions. Even though these are not anonymous, students are likely to feel more willing to expose the weakness of a hidden self, provided that care is taken to create a non-judgmental online climate.

In tension with the capacity for responsiveness is its cost in instructional time. Perhaps precisely because of the medium's greater ability to elicit student questions, online computing has been demonstrated to exceed time demands on face to face instructors (Connolly, MacArthur, Stansfield & MacLellan, 2007).

Taken together with the simple potential of online QDAS training to reach such a wide audience, the challenges and promise we see seems likely to move all of us forward as an international community of qualitative researchers.

Implications
The Continuing Evolution of Qualitative Data Analysis Software

In 1995 Weitzman and Miles made the following observation:
Ten years ago, most qualitative researchers were typing up their handwritten field notes, making photocopies, marking them with pencil or colored pens, cutting them up, sorting them, pasting them on file cards, shuffling cards, and typing their analysis. A few were beginning to use word processors for their write-up field

notes, and a few were starting to explore database programs as a way to sort and access their voluminous text (pp. 3-4).

Just over ten years later and qualitative data analysis software (QDAS) is becoming an integral part of the qualitative research landscape. Weitzman and Miles (1995) went on to describe six different types of analysis software. The role of software was still emerging and there were different perceived functions that could or should be approached from a technological standpoint. In 2007, Lewins and Silver described only two basic types of software. Many of the previous categories had been folded into the two remaining. As the use of technology in a given area matures, it is not unusual to see the emergence of a more standardized format on which the industry operates.

Advances in technology, including the capabilities of database applications, teamed with the increased sophistication of the QDAS users are driving software developers to push the boundaries of what is possible. Software that was once built around the analysis of text is growing to include audio and visual data to be integrated directly into the program. Being able to code these files without having to first create a transcript is providing even richer data.

The Increasing Importance of Online Learning

In 2007 the Sloan Foundation published its fifth annual report on the state of online learning in United States higher education. An important pattern emerging from the data involves the enrollment of students in at least one online course as compared to the overall higher education enrollments. Allen and Seaman (2007) write:

> The number of students taking at least one online course continues to expand at a rate far in excess of the growth of overall higher education enrollments. The most recent estimate, for fall 2006, places this number at 3.48 million online students, an increase of 9.7 percent over the previous year. The number of online students has more than doubled in the four years since the first Sloan survey on online learning. The growth from 1.6 million students taking at least one online course in fall 2002 to the 3.48 million for fall 2006 represents a compound annual growth rate of 21.5 percent. The size of the entire higher education student body has grown at an annual rate of around 1.5 percent during this same period (from 16.6 million in fall 2002 to 17.6 million for fall 2006 - *Projections of Education Statistics to 2015*, National Center for Education Statistics) (p. 5)

The ability to deliver quality online instruction is an area of prime importance for institutions of higher education. Online learning, through the use of the internet, allows individuals who share similar interests from various geographical areas to come together and learn. This virtual learning community can be organized in a variety of formats including a formal instructor/student relationship to a collaboration of skilled and knowledgeable individuals working toward the generation of new understandings. The ability to efficiently and effectively undertake activities such as this continues to hold great promise for the future of education. Every opportunity to improve this format of learning and teaching needs to be taken, reflected upon, and have the results shared with others working in this environment.

QDAS and the Internet

In its early iterations, QDAS development was focused on helping individual/small groups of researchers work more effectively and efficiently with data. The software had a focused purpose. Because of this many researchers could teach themselves how to use a particular software package which addressed the needs of their study. Collaboration often involved some level of direct interaction between or among the researchers and information could be shared via printouts and papers.

The growth of the internet has had an impact on how research takes place and QDAS has had to address a number of issues in order to meet the demands of today's users. Being able to provide the complex and sophisticated integration of data required by researchers is pushing the limits of today's computer technology. Allowing multiple users from a number of remote locations to access and work with a shared set of data is challenge facing most, if not all, QDAS developers.

As QDAS programs grow in complexity the need for directed training grows. More and more of this training will be taking place through online workshops and courses. This format presents challenges for those asked to provide this instruction. One of the first is being sure that all participants have the correct equipment and version of the software. Another is identifying the most efficient and effective techniques to provide instruction and feedback to the students. When do you use synchronous versus asynchronous instruction? What is the appropriate balance between text based and audio-visual instruction? What are the technical limitations placed on the ability to share sample projects in an online environment?

For researchers collaborating on projects over the internet there are other concerns that need to be addressed. Coordinating the way individuals access and interact with the project needs to be considered. If, for example, the project is to be stored in shared location, usually it can be accessed by only one individual at a time. On the other hand, if each researcher has their own copy of the project, the issue of updating the project to reflect each researchers work becomes an issue. A major concern when data is being shared over the internet is security. The issue of confidentiality becomes paramount.

Conclusion

As we approached this project the complexity of the QDAS software, the abilities/limitations of the available technology, and foundations of successful instructional practice all had to be considered and informed and shaped our journey. The demand for online instruction is growing and will continue to grow for the foreseeable future. The ability to provide effective instruction in the use of tools such as QDAS will continually need to be studied and appropriate techniques developed. We hope our experience with this pioneering project will invite fruitful discussion and pave the way for other initiatives.

References cited

Allen, I. E., & Seaman, J. (2007). *Online nation: Five years of growth in online learning*. Boston: Sloan Consortium.

Collins, J. (2001). *Good to Great: Why some Companies Make the Leap...and Others Don't.* New York, Harper Collins, Inc.

Connolly, Thomas M.; MacArthur, Ewan; Stansfield, Mark; McLellan, Evelyn. (2007). A quasi-experimental study of three online learning courses in computing. *Computers & Education, 49*, 345-359.

Davidson, J. (Chair), Morse, J., Roulston, K., Freeman, M., Denzin, N., and Jacobs (2007). *Institutionalizing Qualitative Research: Emerging Models.* Panel presented at the Third International Congress on Qualitative Inquiry. Champaign, IL, May 2007.

diGregorio, S. & Davidson, J. (2008—in press). *Qualitative research design for software users.* London, Open University Press.

Kaczynski, D. & Kelly, M. (2004). Curriculum Development for Teaching Qualitative Data Analysis Online. *Proceedings of QualIT2004: International Conference on Qualitative Research in IT & IT in Qualitative Research. 24-26 November 2004, Brisbane, Australia. Hosted by the Institute for Integrated and Intelligent Systems, Griffith University.Copyright the authors and QualIT. Keywords: QDAS, Qualitative Research Education, Nvivo, Desire2Learn.*

Moore, Nelson, etc. (AERJ article on the pain of qualitative research!)

Lewins, A., & Silver, C. (2007). *Using software in qualitative research: A step-by-step guide*. London: SAGE Publications

Riis, J. (1971). *How the other half lives*. New York, Dover Publications, Inc.

Weitzman, E., & Miles, M. B. (1995). *Computer Programs for Qualitative Data Analysis: A Software Source Book*. Thousand Oaks, CA: SAGE Publications.

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