Integrating ATLAS.ti Into An Undergraduate Qualitative Research Course: Evaluating Students' Experiences

Neringa Kalpokaite, Ivana Radivojevic

Abstract

This paper describes an evaluation of a qualitative research course for undergraduate psychology students at IE University (Instituto de Empresa, Segovia, Spain) by analyzing students' perceptions and experiences as gathered through an open-ended questionnaire. Students studied qualitative methods, learned to use the computer-assisted qualitative data analysis software (CAQDAS) ATLAS.ti, and applied their knowledge in a case study research project on the leadership of an international company. Overall perceptions of the course are positive, and students generally valued the learning and practical experience they gained. The students recognized this course as an important complement to their predominantly quantitative curriculum. As a result, this paper encourages other interested lecturers and professors of undergraduate students to integrate CAQDAS into their own qualitative research curricula.

Keywords

Teaching qualitative research, undergraduate, CAQDAS, ATLAS.ti

Introduction

The qualitative paradigm is an important approach to research that has much to bear on a variety of disciplines; from psychology, anthropology, and sociology, to education, public health, and management (Gibbs, Taylor, Fielding, & Lewins, 2006). While interest in learning qualitative methods is growing (Breuer & Schreier, 2007; Keen, 1996; and Shaw, Dyson, & Peel, 2008), instructors face particular challenges in transmitting their knowledge. Firstly, the researcher plays a very central role in the process of gathering and analyzing data, and this can seem to be a rather nuanced or even confusing approach to research for students with a primarily quantitative background (Braun & Clarke, 2013; and Gibbs, Taylor, Fielding, & Lewins, 2006). The practice of qualitative research has been referred to as a "craft," whereby the student needs to learn through hands-on experience and close support from a "mentor" (Breuer & Schreier, 2007). Providing this sort of training can be challenging enough for any instructor—a position which is exacerbated by the relatively sparse amount of literature available on teaching qualitative research. While there is a large body of resources on *conducting* qualitative research, there are much fewer guidelines on *teaching* it (although, Onwuegbuzie et al., 2012, provide an extensive meta-framework for teaching qualitative research). Yet, even as this issue is gradually being addressed, various researchers still recognize this gap in the literature (Blank, 2004; Flick, von Kardorff, & Steinke, 2004; Onwuegbuzie et al., 2012; Paulus & Bennett, 2014; Paulus & Bennet, 2015; and Shaw, Dyson, & Peel, 2008).

An even more neglected area of teaching qualitative research is that of teaching students how to use computer-assisted qualitative data analysis software (CAQDAS) packages. The rapid development and progression of CAQDAS that can be seen nowadays has opened up a whole new range of techniques for analyzing qualitative data. Yet, as Paulus and Bennett (2015) point out, there are only a handful of studies that discuss teaching CAQDAS specifically. The authors recognize that, while distrust of CAQDAS among qualitative researchers persists for a variety of reasons, young researchers today are already

deeply accustomed to using and dealing with technology, and they are even actively seeking ways to integrate new tools into their research. The authors further point out that a classroom is arguably the best place to learn the different affordances and constraints of CAQDAS. Their idea is to introduce novice scholars to such software so as to enable them to judge for themselves how to adopt the tools in their own practice, if at all. For the professor interested in integrating CAQDAS into their own curriculum, there are some academics sharing their different experiences, course frameworks, and suggestions for best practices.

For example, Walsh (2003) shares her perceptions on teaching qualitative research and the use of the CAQDAS NVivo to undergraduate students, in which she emphasizes the use of peer reviews in a workshop-style environment. She shares her overall positive experience with teaching the course, remarking that the students produced well-documented and interesting final papers. Paulus and Bennett (2015) describe their postgraduate course in qualitative research methods in which students learned to use the CAQDAS ATLAS.ti through a very practice-based approach that positioned the software as a project management tool rather than the be-all and end-all of qualitative data analysis. Interestingly, the authors also found the natural occurrence that, as a result of learning the use and tools of ATLAS.ti, students from their course went on to spread this knowledge: they were either invited to teach the basics of ATLAS.ti to their peers, or they clarified the use of the software to their senior researchers or chairs. By sharing their work with ATLAS.ti, students effectively showed their mentors how ATLAS.ti would not take control of the analysis, and how transparency could be improved through use of the software, thus demystifying some of the common doubts regarding CAQDAS. This is one example of how teaching qualitative research may bear valuable outcomes outside of the classroom as the community of qualitative researchers grows. Onwuegbuzie et al. (2012) further support this idea by encouraging their students to share their knowledge on qualitative research by team-teaching in university courses.

While these researchers share their personal experiences with teaching CAQDAS, Gibbs, Taylor, Fielding, and Lewins (2006) present the learners' side of the process by observing and interviewing people conducting qualitative research with a range of CAQDAS. The authors thus provide insights on different challenges and views towards using CAQDAS, such as the relationship between using software as a tool and the importance of the researcher in making methodological decisions and maintaining quality criteria in one's work. The important distinction is that CAQDAS is a *tool* that the researcher may use in order to carry out a qualitative data analysis. Learners sometimes believe that, by learning to use CAQDAS, they will be able to use the software to do their analyses; this misconception may possibly stem from quantitative backgrounds, where one assumes that CAQDAS works in a similar way to SPPS, for example (Gibbs, Taylor, Fielding, & Lewins, 2006). Besides this, confusion regarding the relationship between qualitative research and CAQDAS sometimes led to perceived shortcomings of software; however, such problems are often due to the individual's misunderstanding of the process of qualitative data analysis or

their inability to maneuver the software effectively (Silver & Rivers, 2014). To avoid confusion, the role of CAQDAS within qualitative data analysis is very important for teachers to emphasize.

The practice of sustaining a dialogue between teachers and learners is another crucial point to consider, as local and expert support is central to learning qualitative data analysis and CAQDAS (Gibbs, Taylor, Fielding, & Lewins, 2006). As Silver and Rivers (2014) elaborated, learners' initial excitement about software seems to diminish rapidly as learners begin to use the software themselves, run into problems, and end up feeling confused or frustrated. As learners begin to apply their knowledge to their own work, they quickly figure out where they are doing well and where they are struggling. The local support of a teacher can greatly facilitate the interaction with technology: learners can quickly and painlessly have their questions answered and their doubts resolved (Paulus & Bennett, 2013). In the long run, this can greatly ease learners' difficulties, fears, and insecurities with both qualitative data analysis and CAQDAS (Gibbs, Taylor, Fielding, & Lewins, 2006).

Finally, it is also important to consider that most courses on qualitative research and CAQDAS are taught at the postgraduate level. Undergraduate courses in qualitative research tend to provide (relatively brief) introductions with little hands-on experience, while postgraduate courses are much more focused on specializations within qualitative research (including learning about the different underlying theories), and in-depth practice is more commonly prescribed (Shaw, Dyson, & Peel, 2008). As a result of inconsistent undergraduate educations, though, students typically enter qualitative research courses with varying levels of background experience and expectations. In reality, some may be only beginning to learn about qualitative research, while others may be under the pressure of completing their postgraduate dissertations.

Although teaching CAQDAS is usually done in more advanced courses, introducing undergraduates to this technology potentially offers a variety of advantages. For one, as Paulus and Bennett (2015) suggest, the classroom environment provides an ideal space for experimenting with new tools in a low-stakes environment (as there are no worries of grants, dissertations, and the like). Since learning to use CAQDAS (and conducting qualitative research) is so dependent on hands-on experience, an undergraduate course can be useful for tackling common main hurdles, especially in terms of learning to technically maneuver software and develop one's individual understanding of what qualitative research consists of. Psychology programs, for example, tend to be dominated by quantitative methodologies with only an introduction to what qualitative methodologies consist of; this often leads to misguided perceptions as to where qualitative approaches fit in the world of research (Breuer & Schreier, 2007; Gerstl-Pepin & Patrizio, 2009; Paulus & Bennett, 2015; and Shaw, Dyson, & Peel, 2008).

Besides providing a more rounded education in this sense, teaching CAQDAS and qualitative research at the undergraduate level allows students to get a feel for what qualitative research is really like by "getting their hands dirty" with actually using software to analyze data (in a similar way as SPPS is commonly taught; Walsh, 2003). Moreover, learning a new paradigm of research can be daunting, and

some students may even be resistant towards it (Paulus & Bennett, 2015). By teaching students what qualitative research consists of early on in their educations, they have the opportunity to experience and overcome the common insecurities and misperceptions regarding the qualitative approach, thus allowing them to make better-educated decisions when pursuing their studies or careers for what they want to specialize in. If young researchers are taught about qualitative research and the use of CAQDAS as a tool, it is already a small, but significant, step in the right direction towards demystifying these technologies and the sometimes-perceived lower academic quality of qualitative studies (as mentioned by Blank, 2004; Gerstl-Pepin & Patrizio, 2009; and Shaw, Dyson, & Peel, 2008).

Purpose Of The Study

At IE University (Instituto de Empresa; an international university in Segovia, Spain) the psychology undergraduate program includes a semester-long, mandatory course on qualitative research for all second-year students, in which they are taught theoretical and practical knowledge through the use of the CAQDAS ATLAS.ti. As teaching CAQDAS alongside an undergraduate curriculum has not been very much explored yet, the aim of this study is to present the experiences of the students as a way of providing potentially useful information for other interested teachers of CAQDAS. Moreover, by exploring how the students understood and perceived the course, it is possible to examine to what extent teaching this kind of undergraduate course is feasible and appropriate. This paper will first outline the qualitative research curriculum and then analyze the process and outcome of this course through an open-ended questionnaire in which the students expressed their views on qualitative methods and the use of ATLAS.ti. Through such academic evaluations, the practice of teaching CAQDAS may continue to move forward, and teachers can further develop a dialogue for exploring new strategies in training researchers.

Methodology

This study will meet its objectives by analyzing this course across three dimensions, as summarized in the following table (Table 1).

Dimension	Desired Competencies
Qualitative Research	Basic concepts of research process (literature review, data collection, data analysis, discussion, and conclusions); basic methodological foundations (epistemological and ontological assumptions, research gaps, research questions, quantitative versus qualitative foundations, and inductive-deductive strategies)
ATLAS.ti	Ability to create Hermeneutic Unit (HU), add primary documents, conduct literature review, conduct analysis, develop and document ideas, and work in groups (all within ATLAS.ti); ability to create codes, quotes, memos, families, semantic links, and semantic networks
Practice	Ability to conduct small-scale qualitative research study using ATLAS.ti; ability to design and carry out open-ended questionnaire and semi-structured interview; ability to transcribe, analyze data, discuss results and literature review, and present overall study coherently

Table 1: Operational definitions of dimensions

The research questions are as follows:

- What are students' perceptions regarding theoretical aspects of qualitative research?
- What are students' perceptions regarding ATLAS.ti?
- What are students' perceptions regarding the practice of qualitative research?

The Undergraduate Qualitative Research Course

The course is designed to introduce undergraduate psychology students to the theoretical and practical fundamentals of qualitative research through the analysis of a case study using ATLAS.ti. This was implemented as a mandatory semester-long course for all second-year psychology students at IE University due to previous students' demand for a more rounded education in research that included training in the qualitative paradigm. Before this, the psychology curriculum taught only quantitative research methods; learning about qualitative research was left as an optional course in the final year of studies. The present qualitative research course was hence developed to introduce all psychology students to the basics of designing a qualitative study, collecting data, analyzing results, and presenting findings, all through the use of ATLAS.ti.

Students were taught qualitative methods (primarily open-ended questionnaires, focus groups, and interviews), and how to conduct a project from start to finish with ATLAS.ti. While students were taught about the different epistemological and ontological assumptions of qualitative research, the present course does not delve too deeply into qualitative research theories. In order to train students in the practice of conducting qualitative research, more attention was paid to methods, which could be applied to a broad range of approaches. When learning how to analyze qualitative data, students used Braun and Clarke's (2013) textbook and focused on identifying themes and patterns in their data, categorizing and organizing themes, and subsequently presenting their findings. While an understanding of the different types and theories of qualitative research is important, the focus of this course was that students gain the necessary skills to conduct many different kinds of qualitative research (though not all, of course). As Blank (2004) explains, among the various types of qualitative research, almost all of them share an interest in analyzing text and categorizing this information to extract common themes and concerns. For a single-semester, undergraduate course, focusing what is to be taught in this way allowed for a course that was feasible and provided relevant, useful skills to be taken away at the end.

The dialogue between theory and practice is central to the course. There are 30 sessions that consist of lectures, and practice is incorporated by way of the class project. The students conducted a case study on an international company's leadership. Five groups of 3-5 students were formed, and each group explored one dimension of leadership. In other words, the class as a whole conducted a qualitative study on the leadership of one company by separately examining the company's vision, communication, decision-making, negotiation, and power. Students designed an open-ended questionnaire (administered to the managers of this company) and a semi-structured interview guide (conducted with the CEO). Afterwards, each group analyzed their data according to their leadership dimension. At the conclusion of

the course, the groups put their work together and presented an overall case study of the company's leadership and provided suggestions for improvement based on their analyses.

This project spanned the entire course, and it was made manageable by being broken up into weekly tasks. As the central point of the course, the teaching of qualitative research was organized around the practice of the project. For example, in one of the first lectures, students were taught about research questions and ways to approach different questions; the assignment after this lecture was to create the research questions for their group work. The course hence progressed with this pattern of learning and carrying out the sequential steps of a study.

This week-by-week, step-by-step approach not only made embarking on a qualitative study for the first time more manageable, but it also allowed for ample support to be incorporated throughout the course. As the students presented their work each week, they received feedback and resolved any doubts or questions with the instructor. The presence of local, expert support was very important, because the students were learning qualitative research design, qualitative data analysis, and ATLAS.ti. The professor was available in class and through email, and the research assistant was available for out-of-class tutoring. As such, the professor-student dialogue was maintained so that students had a space to practice, make mistakes, and learn.

The main objectives of this course were threefold: to teach students the basics of qualitative research, to train students to use ATLAS.ti, and to equip students with practical skills through their case study project. The course was designed to introduce undergraduate students to qualitative research as a foundation from which they could further develop their studies and careers.

Methods And Qualitative Data Analysis

This study collected data through an online open-ended questionnaire that was distributed at the end of the course to the seventeen students enrolled. In this way, each student had the opportunity to express and evaluate their perceptions of the course. The main questions revolved around the three dimensions of the course: How students perceived and understood the theoretical contents regarding qualitative research, how students perceived and understood the use of ATLAS.ti, and how students perceived and understood the case study project on leadership. Moreover, students were asked to explain which parts of the course they found interesting, boring, and too difficult. Students were then asked to describe how learning to use ATLAS.ti and conducting the case study project influenced their understanding of qualitative research. Through their responses, the authors were able to evaluate this course's successes and shortcomings, whilst providing feedback for future practices based on these students' experiences. As such, this questionnaire was designed specifically for the purpose of this study (separate from the course evaluations that the university administers through its campus online platform).

The roles of the two researchers involved in this study are that of the professor of the course and the research assistant. Both the professor and research assistant were available throughout the course for support and guidance to the students, and both came to be very familiar with each group's work and progress. The analysis of results was first conducted by the research assistant, and the data was then re-coded by the professor.

The analysis of the students' responses was conducted using ATLAS.ti. The responses were coded with a deductive-inductive approach: Deductive codes were based on the three dimensions of the course, while inductive codes emerged during the analysis process. The responses were re-coded and grouped to ensure consistency; then the codes were re-organized into the final conceptual framework (using the semantic framework tool of ATLAS.ti), as presented in the following section. This final conceptual framework—with the groundedness of each code—thus visualizes and summarizes the findings based on students' overall perceptions. Finally, the responses from this research were compared and contrasted with findings from other studies.

Sources And Collection Of Data

All of the students enrolled in the qualitative research course at IE University participated in the study. As this undergraduate degree was their first higher-level education in psychology and research, each of the students was at a more or less similar level in terms of expertise and experience with research. This greatly aided the progress of the course, as the concepts and case study group work was novel to each of them: They learned and worked together, supporting one another through the development of the course, further ensuring that each student was able to keep up with the course through their collaborative group projects.

Consent for students' participation was obtained electronically by having each individual read information regarding the purpose and aim of the study and the open-ended questionnaire. They were informed that all of their responses would be kept anonymous (through use of pseudonyms). Upon reading this, each student was asked to indicate whether or not they understood all of the information and agreed to complete the questionnaire. If the student selected "yes," they were taken to the online platform with the open-ended questionnaire. Their responses were subsequently imported into ATLAS.ti and analyzed. Wherever responses are quoted in the present paper, pseudonyms are used.

The main ethical considerations of this study regard the dual relationships of professor-student and researcher-participant. As the role of the professor involves teaching and evaluating, a professor further studying the experiences of the students in a separate research adds another layer to this dynamic. For this reason, it was crucial that each student understood that their responses would remain confidential. The research assistant's contribution to this study was also an important part of this ethical consideration, for the research assistant was in a position of much less influence with each student, thus further supporting the design and analysis through this more outsider role. Therefore, while potentially

problematic, the authors of this paper utilized their respective insider and outsider roles to maximize the advantages and minimize the drawbacks of each. The professor had extensive experience with the course (and teaching ATLAS.ti and qualitative research in general), while the research assistant was a recently graduated student who was closer to the participants' perspectives in this respect. Together, a coherent and informative description and evaluation of the undergraduate course is hence presented.

Analysis Of Results And Discussion

The following conceptual framework presents a summary of the findings from this study. By examining the groundedness of each concept, it is clear that, although students had certain negative perceptions, there were many positive perceptions, as well. Almost all of the students felt they had learned a lot, despite their perceiving this course as one of the most demanding of their semester.
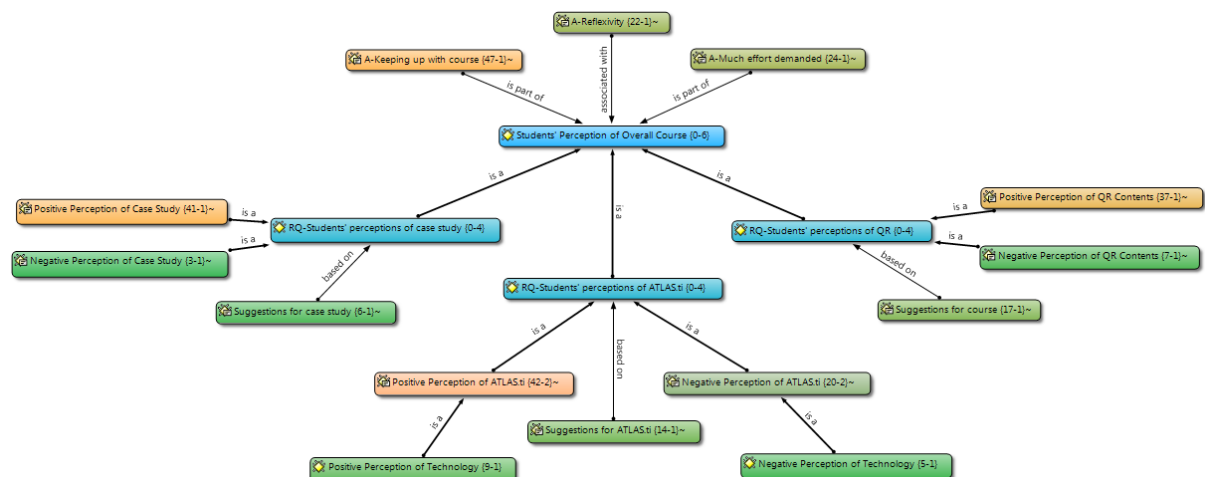

Figure 1: Conceptual framework — summary of results

Students' Understanding Of Basic Theoretical Aspects Regarding Qualitative Research

Students' responses indicated a sufficient understanding of the basic theoretical aspects regarding qualitative research. Some of the responses explicitly illustrated what was found to be most interesting. Catherine, for example, explained,

> The readings are genuinely interesting because they have taught me a few things, such as how to approach an article, looking at the theoretical frameworks, research gaps and school of research.

Sara, on the other hand, spoke about the process of understanding and analyzing data, such as seeing how concepts "relate or contradict each other... how particular concepts are most important... how they play an important role or the opposite," and how she understood the process of reviewing, identifying a research gap, analyzing data, and obtaining "useful results in order to grasp informative and useful concepts." She mentioned each of these things specifically in regards to her work on the case study

project. Similarly, other students emphasized that they liked the textbook or that the material was interesting because of its importance within psychology. As Katharina noted, "all the things that I have learned will be very useful for my future as a psychologist."

In instances where students did lack some understanding of the basic concepts of qualitative research, they admitted certain problems with keeping up with the course and doing the reading assignments on time. While no particular task was deemed too difficult to be understood at all, many students did mention that attending the sessions and keeping up with the assignments was crucial to not falling behind and becoming lost. Maria's perspective on keeping up with the class perhaps summarizes these issues,

> I have been to all but one class because I feel like missing one of your classes is detrimental to my improvement in the area of qualitative research. In general, it was easy to follow because the professor was instructive and thorough in class lectures; however, content was somewhat difficult or, more precisely, different because we have been learning about using the program which requires patience and concentration. You cannot allow yourself to miss any step.

She specifically referred to ATLAS.ti (the program) being demanding on patience and concentration, a view that was shared by the majority of the students. This is not surprising, though, given that previous literature has also demonstrated such challenges that come with learning to use CAQDAS (Blank, 2004; Gibbs, Taylor, Fielding, & Lewins, 2006; Paulus & Bennnett, 2015; and Silver & Rivers, 2014). This is one of the main reasons why, when it comes to teaching CAQDAS, it is preferable to spread the teaching out through a longer course (as in the examples of Blank, 2004; Paulus & Bennet, 2014; and Walsh, 2003), rather than teaching the use of a CAQDAS package in a single workshop (as in the example of Silver & Rivers, 2014).

At the conclusion of this course, it was also clear that the students were able to distinguish between what makes research qualitative and what makes research quantitative. Alice, for example, found this distinction to be a strong point of the course,

> The concept of qualitative research is so different from what we are taught in other courses that it was inherently interesting as a contrast to the most frequently used and accepted methods in psychology.

Many students expressed an appreciation for learning the qualitative approach to research. Julia explained how she started knowing "nothing at all" about qualitative research, but she found it very useful, and now "would love to learn even more about it" because she enjoyed how it "is very structured and also... like real research, that is embedded in facts and serious validated studies." As the psychology curriculum of these students is primarily quantitative, it seems that they generally enjoyed learning about research that is based on words (not numbers) and enriched by contexts (as things are in the "real world"). Amanda similarly expressed,

> Since the type of research done in school and the type of research we had been taught here at IE last year was only quantitative, this course has definitely opened many possibilities in regards to

research we could choose to do in the future. Personally, I have never been a passionate person about doing 'research' (as I understood it before) and writing lab reports. However, qualitative research is without a doubt much more interesting to me than any other types of research I have done before.

This course introduced a new way to approach research that clearly resonated with her. This realization of having misunderstood what research (and specifically qualitative research) has to offer was common across several other students. Leonard spoke similarly about the use of ATLAS.ti,

I personally liked learning about the software, especially considering that we already learn about a quantitative software in statistics, it's a nice complement, and necessary.

These kinds of responses show that the course was perceived well by the students. While certain difficulties were present, many of the students at least valued learning about this new way of conducting research. This echoes previous findings in the literature as well, where both teachers and learners have expressed an interest (and, in some cases, enjoyment) in learning qualitative research (Breuer & Schreier, 2007; Keen, 1996; Shaw, Dyson, & Peel, 2008). Moreover, responses such as Leonard's show that some young researchers are particularly interested in learning to use software tools within qualitative research (as has also been exhibited by Paulus & Bennett, 2015; and Walsh, 2003). Findings such as these are encouraging for teachers of CAQDAS, for they illustrate not only a growing demand for being trained in the use of software but also an inherent acceptance and adoption of this relatively new technology, which Silver and Rivers (2014) emphasize are important aspects of successfully learning CAQDAS. This further supports the remark that Paulus and Bennett (2015) made in pointing out that the "digital native" millennial generation, now in the progress of their university educations, are more comfortable than ever with a pervasive use of technology. These kinds of findings exhibit that there is an interest and feasible space for undergraduate researchers to be trained in using CAQDAS.

Students' Understanding And Use Of ATLAS.ti As A Tool For Analyzing Qualitative Data

The ATLAS.ti dimension was almost unanimously considered to be the most difficult aspect of this course. The overall conceptual framework illustrates this through groundedness: Negative perceptions of ATLAS.ti far outweighed negative perceptions of both the methodological content and the case study project. The most challenging aspects of ATLAS.ti were either technical or conceptual. On the technical side, students mostly had difficulties learning all the commands of the software; on the conceptual side, most struggles revolved around analyzing, coding, and using memos. Sara spoke about her experience with the technical difficulties of using ATLAS.ti:

I feel that at first it was a huge struggle, but I realized that the more you focus and work on it, the more you will start to understand it. There are a lot of concepts to learn, which I found difficult at first because I had to remember how to do particular things. I feel that my work with ATLAS.ti has certainly improved and so has my confidence towards it.

Her view seems to reflect that of many other students, for it was commonly mentioned that it took a lot of time and effort to use ATLAS.ti. Also, some students mentioned that they are not very comfortable with using computers, and this was an additional obstacle to figuring the software out.

On the conceptual side of using ATLAS.ti, Amanda reflected,

> At the beginning, I found it a bit difficult to understand how to code and analyze the articles, not technically, but more in regards to what I should be analyzing and looking for... However, I got the hang of it and I do feel like I completed a good (but not extraordinary) literature review. Then, I feel like after creating the networks and starting to analyze in ATLAS.ti the quality of my work improved. I already understood and had a better idea of what to code... Overall, I think there are obviously aspects of ATLAS.ti which I am not familiar with and ways in which I could improve, but since this is my first time ever using the program I feel like I did a good job.

Amanda's reflection on the progress of her work is echoed in others' responses. Students commonly mentioned that in the beginning, while conducting their literature reviews, they certainly struggled with some of the technical and conceptual aspects of ATLAS.ti. However, by the time they reached the analysis of their data, they felt much more comfortable and confident with the overall process. As Esme said, despite the initial struggles, she "didn't think any part was 'too' difficult."

While most students found using ATLAS.ti to be challenging, almost all of them explicitly recognized the importance and utility of this software to the process of qualitative research. Some even mentioned that they planned to continue using ATLAS.ti in other projects, and students were generally very happy about having gained this new skill (a few students even pointed out they would include this in their CV). Amanda explained,

> The more we used ATLAS.ti, the more we understood why it is so valuable to qualitative research. I think ATLAS has so many great tools which facilitate the long and time consuming process of qualitative research from literature review to analysis...in regards to the understanding of qualitative research, I think the more we learned about it the more we realized why ATLAS.ti was so useful, and it was definitely a tool which allowed us to apply the theory we were learning.

Several other students also pointed out that the tools of ATLAS.ti helped them better understand the concepts and processes of qualitative research, such as "turning analysis into an interactive process" (from Vincent), showing how "critical, skeptical and reflective" one has to be (from Maria), to the understanding of how qualitative research "can be more of a 'structured' or even unstructured process that is really in the hands of the participant" (from Patricia). In the end, the students' experience with ATLAS.ti seems to not only have provided them with new practical skills, but it also benefited their overall understanding of qualitative research.

Many students felt that this use of technology facilitated and strengthened the qualitative research process—while some were pleased to learn qualitative software alongside their previous education in statistical software, others were positively surprised to find how rigorous and scientific analyzing interviews, articles, and other qualitative data could be. Nonetheless, for some students, using computers was not very intuitive, and this further complicated their learning to use ATLAS.ti. These students

expressed a lack of confidence or ease with computers, which in the case of Sara created a "block" at first, and for Marina, her insecurities with computers was a "barrier" that made her enjoy the overall process much less.

Any negative perceptions of technology regarded this innate difficulty with computers (or, in other words, the high demands of computer-use that this technology necessitates). Ultimately, this is not very surprising as such struggles with technology when learning to use CAQDAS have also been reflected in the literature (Gibbs, Taylor, Fielding, & Lewins, 2006; and Silver & Rivers, 2014). As has already been pointed out, this generation of learners is the most comfortable with technology yet (Paulus & Bennett, 2015), but it is also important to realize that this cannot be a general assumption for all undergraduate students — even in this case, there were individuals who did not feel such ease with the high demands of this technology at times. When this occurred, the local support of the instructors was extremely important in helping students overcome their blocks or barriers to successfully complete the course.

Interestingly, none of the students expressed any expectation that ATLAS.ti would provide a "magic solution" to their analysis nor guide the actual work of analyzing data. When explaining how ATLAS.ti influenced her learning, Marianna said,

> I have to say that I do not think it actually helped understand the assumptions or theories of qualitative research. Yet, it helped understanding the actual process of research (as the project) and of course it facilitated the process of analyzing data.

Her response shows that the use of ATLAS.ti did not replace the process of thinking about and understanding assumptions behind qualitative research; rather, the software helped her understand the practice of qualitative research. Leonard, too, described ATLAS.ti as "just another tool, in a long list of tools that can be used for qualitative research," after which he pointed out that "qualitative research is very dependent on the researcher's approach." Understanding the difference between the process of analyzing qualitative data and the use of CAQDAS has been previously identified as a relatively common misunderstanding of learners to which teachers need to pay special attention (Gibbs, Taylor, Fielding, & Lewins, 2006; and Silver & Rivers, 2014). Given the types of responses in the present study, it is clear that students were able to understand the relationship between conducting qualitative research and the use of ATLAS.ti as a tool in facilitating the collection, analysis, and presentation of qualitative data.

Students' Application Of Technical And Methodological Knowledge By Conducting A Qualitative Case Study On Leadership In An International Company

As for the actual work on the case study group project, this was most often referred to as the most interesting part of the course. Overall, students very much enjoyed the real world experience, and most of them found it to be incredibly instructive as it was their first time completing a qualitative study from start to finish. Whether or not students individually enjoyed conducting qualitative research, the value of the case study project was nearly unanimous. Once they began analyzing their actual data, most

students understood the methodology behind the process of qualitative research much better. As Marianne distinguished:

> It clears out all the doubts. When studying the main assumptions of qualitative research, a lot of question arise and as much as the professor always gave us answers, the project was the best way to understand qualitative research.

Katharina expressed her agreement that, "if we wouldn't have worked on this project, we wouldn't have learned as much as we did about qualitative research," and for Vincent, the project was "where things clicked together, and where the understanding came into one single meaning." The students clearly perceived the hands-on experience of the case study project to be valuable, and many also emphasized that they genuinely enjoyed conducting interviews, transcribing them, and using the many tools of ATLAS.ti to conduct qualitative research. As Amanda reflected,

> The leadership project was an amazing way to learn about qualitative research. I think that having had the opportunity to learn about it from this practical and real world project has taught us and given us so much more experience than just looking at PowerPoint slides and learning theory ever would.

This also brings into focus the importance of the teacher-learner dialogue. Whether it was difficulties with the software or the qualitative research process itself, students could eventually benefit from close support with the professor. Sara, one of the students who had difficulties with technology, expressed her gratitude for the instructors' help because this subsequently increased her confidence towards the subject and she even "realized that coding and the whole notion of using ATLAS.ti is not so difficult after all." In regards to general questions about the coursework, Catherine found that being able to meet one-on-one with the professor and research assistant to be very helpful, as she explained, "Since I struggle asking things in class this was perfect for me—just quietly sitting with someone who can explain things thoroughly." While understanding during class lectures may be straightforward enough, oftentimes many questions or doubts arose once the learner began to put this knowledge into practice. Given this cycle of learning, maintaining support throughout the course (inside and outside the classroom, as much as possible) was crucial for ensuring that students really got the most out of the course.

The importance of teacher-learner support in qualitative research training has been well documented in the literature, as well. Breuer & Schreier (2007) refer to this in regards to learning the "craft" of qualitative research. Walsh (2003) emphasizes the benefits of having a workshop-style atmosphere. Blank (2004) posits that a classroom setting is ideal for hands-on practice and feedback when learning CAQDAS. Silver and Rivers (2014) identify expert local support as one of the key dimensions to successfully adopting CAQDAS. Paulus and Bennett (2014) integrate an effective feedback system for students' projects through the use of copy bundles, comments, and memos in ATLAS.ti. Gibbs, Taylor, Fielding, and Lewins (2006) found a consistent and common need for teacher-learner support in users of CAQDAS across different disciplines and courses. Onwuegbuzie et al. (2012) propose a framework for the instruction of qualitative research that utilizes a methodology of learning-sharing. Shaw, Dyson, and

Peel (2008) emphasize the relevance of apprentice-style learning rather than following procedural steps from textbook guidelines when it comes to qualitative research. Paulus and Bennett (2015) also emphasizes the importance of having technical support available as well when teaching CAQDAS. Thus, it is clear that, when teaching qualitative research, learners need support in order to truly understand the practice—this support becomes even more pertinent when it comes to teaching CAQDAS; from clarifying technical misunderstandings to guiding the effective use of these tools within a qualitative study.

The responses reviewed here show that teaching qualitative research to undergraduate students is not only possible but can also be extremely valuable to them. As quantitative methods tend to dominate the world of research at the moment, the area of qualitative research is relegated to the background (Blank, 2004; Breuer & Schreier, 2007; Flick, von Kardorff, & Steinke, 2004; and Gerstl-Pepin & Patrizio, 2009). Until it is explicitly taught (as quantitative research is), individuals' understanding of what qualitative research consists of seems to be mixed with misconceptions or stereotypes (Gibbs, Taylor, Fielding, & Lewins, 2006; and Shaw, Dyson, & Peel, 2008). Although learning an entirely new approach to research was no easy feat for these students, they generally appreciated learning about this other perspective. As Catherine reflected,

> Before doing this, I was always keen on quantitative methods because for me it seemed more scientific. But after doing this, I was able to understand how you can analyze words with importance.

Many of the students in this course came to realize the rigor of qualitative research through their use of ATLAS.ti. Of course, CAQDAS is not a prerequisite for a rigorous qualitative study, but training students to use the tools of CAQDAS may be an interesting approach to making them aware of the importance of transparency, consistency, and coherence in any qualitative study (Blank, 2004; Gibbs, Taylor, Fielding, & Lewins, 2006; Paulus & Bennett, 2015; Silver & Rivers, 2015; and Walsh, 2003).

Students are expressing a notable demand to be trained in conducting qualitative studies (Blank, 2004; Breuer & Schreier, 2007; and Paulus & Bennett, 2015), and as they learn about qualitative research, misconceptions about this approach not being scientific or academic enough are being dispelled (Shaw, Dyson, & Peel, 2008). This is an important step towards attenuating the marginalization of qualitative research which sometimes occurs (Blank, 2004; and Breuer & Schreier, 2007). Ultimately, students who learn both the qualitative and quantitative paradigms subsequently enter the academic world with an appreciation for the fruits that both words and numbers have to offer.

Conclusions

The general norm for teaching qualitative research is that undergraduate courses are introductory, with little practice, while postgraduate courses provide a much more rounded and in-depth experience (Shaw, Dyson, & Peel, 2008). Aside from the integration of teaching ATLAS.ti, the present course is no different

from the norm, for it also serves to introduce undergraduate students to the basics of qualitative research, thus providing a foundation for further studies and development. What this study has shown, though, is that teaching CAQDAS need not be a skill reserved for postgraduate training. The findings from this study are generally similar to findings of other studies examining the experience of teaching and difficulties of learning CAQDAS with postgraduate students (Blank, 2004; Gibbs, Taylor, Fielding, & Lewins, 2006; Paulus & Bennett, 2014; Paulus & Bennett, 2015; and Silver & Rivers, 2014). Given this, it is clear that undergraduate students are just as capable of learning to use CAQDAS as postgraduate students (as also experienced by Walsh, 2003). Taking these points into consideration it would make sense for young qualitative researchers to learn about CAQDAS sooner rather than later: There will always be certain learner challenges or negative experiences, but undergraduate degrees are relatively low-stakes environments which allow ample room for practicing and making mistakes.

Perhaps even more significantly, the sooner researchers learn about CAQDAS, the easier it is to clarify its functionalities and applications. This study found that one of the main things students took away from the course was their deepened understanding of the use of ATLAS.ti within a qualitative study. As the community of researchers using CAQDAS grows, the myths and misconceptions about software are slowly being unraveled (similar to the experience of Paulus & Bennett, 2014). By training undergraduate students in the use of CAQDAS they may also go on to share their knowledge and further demystify perceptions about qualitative research and its various tools.

This course aimed to introduce undergraduate psychology students to the practice of qualitative research. While some students struggled more than others, and several students loved the topic while others saw it as simply another part of their studies, it seems that the course effectively introduced the basic concepts and methods of qualitative research and equipped students with the ability to continue using ATLAS.ti. The students' responses further showed that using ATLAS.ti not only facilitated the research process but, in some cases, it also improved understanding of qualitative research, as well. Learning to use ATLAS.ti, however, was also the one aspect that students struggled with the most (especially at the beginning of the course). Nonetheless, many students found that the different tools and use of codes and memos helped them in learning how to think qualitatively and analytically.

Finally, the progress of students' learning in this course holds some interesting implications for the wider context. It is definitely clear that students initially struggled with using ATLAS.ti and not everything was very well understood (i. e., during the literature review). However, by the time they began analyzing their data, they were already feeling much more comfortable with the software, and their confidence and motivation in the course increased notably as they completed their case study projects. When moving from the literature review stage to the data analysis stage, students found that they were able to use the software better, and understand what the process of qualitative data analysis entails. This shows, on a small scale (even the transition from conducting a literature review to analyzing one's data) that practice and experimentation is fundamental in order to better understand qualitative research.

On a larger scale, this illustrates one of the greatest advantages of teaching qualitative research to undergraduate students. As several students pointed out, their second time conducting a qualitative study would already be much better, because they now know things they wish they had known at the beginning of the course. Indeed, future projects can now be carried out with a much more thorough understanding of the details and features of qualitative research. By taking this introductory course, students already have a more appropriately formed idea of not only what qualitative research is but also how to conduct it. Some students perceived that their improved understanding of qualitative research would make them better researchers or psychologists overall, and many voiced an interest in further pursuing qualitative research.

Suggestions For Best Practices

The following table summarizes suggestions for best practices in regards to teaching CAQDAS packages to undergraduate students. Information from the literature review, the authors' experience, and students' actual suggestions have all been incorporated (where the suggestion did not come directly from the authors, the reference is noted).

Areas of learning difficulty	While technical skills are learned relatively quickly, students seem to struggle more with the conceptual parts of using ATLAS.ti, so it is important to dedicate plenty of time to this part with ample space for students to raise questions and doubts during and after the process; in particular, the use of memos, coding cycles, and the process of analyzing data (i. e., identifying and categorizing themes meaningfully) were the areas of most struggle
Availability	Making ATLAS.ti available at home was a common desire expressed by students (it is recognized, however, that this is difficult to ensure); where campus licenses are available, it is at least pertinent to offer flexible computer lab hours[1]
Research diary	Students often did not grasp the full use of the research diary, so it may be beneficial to offer some optional example questions for students to answer each week that may encourage self-reflection and evaluation (while not implemented in the present study, using the metaphor of the research diary as *Dumbledore's Pensieve*, a reference from the Harry Potter series, may also be helpful, as suggested by Gerstl-Pepin & Patrizio, 2009)
Timetabling	Distributing time well and completing tasks on time is crucial for keeping up, which brought Julia (one of the students in the study) to suggest offering a timetable of the course at the very beginning, showing what the different stages will be and roughly how long each one should take (this way, students will know exactly what to expect and how to keep up, which helps in not becoming overwhelmed during the course).
Allow room for mistakes	ATLAS.ti is best learned through practice, which is why an applied project is always recommended when teaching qualitative research (questions, doubts, and gaps in understanding quickly arise and can thus be resolved throughout the course); moreover, by encouraging students to conduct the literature review using ATLAS.ti, they get their first touch with the software through the analysis of articles, images, etc., so when the subsequent analysis of data begins, students are already more comfortable with using ATLAS.ti
Didactic Support	Local, expert support (from the instructor professor and/or another knowledgeable person) can make all the difference for students, so availability and flexibility in offering additional support throughout the course (e.g., face-to-face meetings or online communications) is crucial.

Table 2: Suggestions for teaching ATLAS.ti

---

1 Note from the editors: ATLAS.ti makes available extremely affordable student licenses for students' personal use in the context of their studies. Such license cost no more (and, in fact, in many cases less) than common textbooks. For details, see http://studentlicenses.atlasti.com

Suggestions For Further Research

Teaching qualitative research to undergraduate students is still relatively novel. Through more experience, different ways to teach the many facets of qualitative research will certainly be elaborated and improved. Further academic studies in this area are the central point around which professors can continue to develop and expand their teachings. This study presented a qualitative research course for undergraduate psychology students, but it would be extremely valuable to examine other disciplines, as well. Qualitative research has many uses and applications, of which the field of psychology is only one.

Another point which would also be interesting to further examine is the difference between teaching undergraduate students qualitative data analysis and CAQDAS simultaneously and separately. As today's undergraduate students form the next generation of researchers, one could explore what the best ways to teach and use CAQDAS are (e. g., early on, later on, or simultaneously). Moreover, longitudinal studies could follow these young researchers' progress and elucidate what the outcomes of these courses eventually are. There are plenty of valuable questions that this area brings forward, and the authors hope that this paper provides some ideas and encouragement for further research and teaching.

Given these students' experiences, the qualitative research course for undergraduate students was certainly a worthwhile endeavor for all those involved. This course was not aiming to produce young researchers capable of conducting a flawless qualitative study; rather, it aimed to introduce students to the world of qualitative research and to provide them with strong foundations from which they can continue to develop and explore. Upon the completion of a project using ATLAS.ti, several students also realized the value of the science behind qualitative research and what this approach has to offer. The real value of this course came from the students' widened understanding of research and the various tools available—with their newfound capacities in qualitative research and ATLAS.ti, they can now move forward in their budding careers with an appreciation of the importance of both numbers and words.

References

Blank, G. (2004). Teaching qualitative data analysis to graduate students. *Social Science Computer Review*, 22(2), 187-196.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. London: Sage.

Breuer, F. & Schreier, M. (2007). Issues in learning about and teaching qualitative research methods and methodology in the social sciences. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 8(1), Art. 30, http://nbnresolving.de/urn:nbn:de:0114fqs0701307

Flick, U., Kardorff, E. V., & Steinke, I. (2004). *A companion to qualitative research*. London: Sage Publications.

Gerstl-Pepin, C., & Patrizio, K. (2009). Learning from Dumbledore's pensieve: Metaphor as an aid in teaching reflexivity in qualitative research. *Qualitative Research*, 9 (3), 299-308.

Gibbs, G. R., Taylor, C., Fielding, N., & Lewins, A. (2006) Qualitative phase of the formative evaluation of learning training needs in computer assisted qualitative data analysis. *Working Paper*. University of Huddersfield, Huddersfield, UK. (Unpublished)

Keen, M. F. (1996). Teaching qualitative methods: A face-to-face encounter. *Teaching Sociology*, 24(2), 166-176.

Kilburn, D., Nind, M., & Wiles, R. (2014). *Short courses in advanced research methods: Challenges and opportunities for teaching and learning*. National Centre for Research Methods Report.

Onwuegbuzie, A. J., Leech, N. L., Slate, J. R., Stark, M., Sharma, B., Frels, R., Harris, K., & Combs, J. P. (2012). An exemplar for teaching and learning qualitative research. *The Qualitative Report*, 17(1), 16-77. Retrieved from http://www.nova.edu/ssss/QR/QR17-1/onwuegbuzie.pdf

Paulus, T., & Bennett, A.M. (2014). Teaching qualitative research methods with ATLAS.ti: Beyond data analysis. Digital Repository of Technische Universität Berlin. Retrieved from https://depositonce.tu-berlin.de/handle/11303/5134.

Paulus, T. M., & Bennett, A. M. (2015). 'I have a love–hate relationship with ATLAS.ti'™: Integrating qualitative data analysis software into a graduate research methods course. *International Journal of Research & Method in Education*, 1-17.

Shaw, R. L., Dyson, P. O., & Peel, E. (2008). Qualitative psychology at M level: A dialogue between learner and teacher. *Qualitative research in psychology*, 5(3), 179-191.

Silver, C., & Rivers, C. (2014). Learning from the learners: The role of technology acceptance and adoption theories in understanding researchers' Early experiences with CAQDAS packages. *Digital Repository of Technische Universität Berlin*. http://dx.doi.org/10.14279/depositonce-4842

Walsh, M. (2003). Teaching qualitative analysis using QSR NVivo .The *Qualitative Report*, 8(2), 251-256. Retrieved from http://nsuworks.nova.edu/tqr/vol8/iss2/6

About The Authors

Neringa Kalpokaite

Manager of International Projects (Training & Partnership Development) at ATLAS.ti Scientific Software Development GmbH & Professor at IE University (Spain)

Ivana Radivojevic

Project Coordinator (Training and Partnership Development) at ATLAS.ti Scientific Software Development GmbH.

Article Information