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Learn by yourself: The Self-Learning Tools for Qualitative Analysis Software Packages

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Abstract

Computer Assisted Qualitative Data Analysis Software (CAQDAS) are tools that help researchers to develop qualitative research projects. These software packages help the users with tasks such as transcription analysis, coding and text interpretation, writing and annotation, content search and analysis, recursive abstraction, grounded theory methodology, discourse analysis, data mapping, and several other types of analysis. This paper focus the new paradigm of self-learning, that presents itself increasingly as a competence to support learning in a proactive way. It further analyses education and CAQDAS with emphasis on the use of CAQDAS in educational research and the self-learning of CAQDAS. The study conducted had two main goals: (1) analyse the self-learning tools of CAQDAS and (2) identify CAQDAS's users learning profile . Six software packages were selected: NVivo, Atlas.ti, Dedoose, webQDA, MAXQDA, and QDA Miner. They were reviewed, taking into account their transversality, language, (self-learning) tools, among other criteria. The results show that there is a considerable demand for information from users regarding the execution of processes in CAQDAS, and that the packages analysed do not guide users towards the self-learning tools that best fit their learning style.

Keywords

Computer Assisted Qualitative Data Analysis Software; CAQDAS; Self-learning and Education.

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I.Introduction

Since the 1980s, the widespread availability of personal computers and the emergence of software packages to support qualitative data analysis have enabled qualitative and qualitative investigations to be carried out with higher quality and depth. Methods of qualitative data analysis have been receiving increasing interest from researchers and practitioners in many areas. Among other techniques, it is worth mentioning content analysis, that has received a prominence in the academic community, allowing increasing the methodological rigor of studies conducted in the areas of social sciences, marketing research ethnography, public health, psychology, among many others.

Currently there are more than fifty software packages available in the market that allow the analysis of qualitative data (Saillard, 2011). Among these packages those that stand out are (Wikipedia, 2016): NVivo (QSR software, 2017; Wikipedia, 2017d), Atlas.ti (Atlas.ti, 2017; Wikipedia, 2017a), Dedoose (Dedoose, 2017; Wikipedia, 2017b), MAXQDA (MAXQDA, 2017; Wikipedia, 2017c) and webQDA (Neri-de-Souza, Costa, & Moreira, 2011; webQDA, 2017) for their broad use, general capabilities and functionalities or capabilities to enable collaborative work. These software packages also do not impose a specific methodological approach, giving the researcher the liberty to select the research approach we wishes to use and to apply different strategies on the research.

Although there is a large number of qualitative analysis software packages available, there is a very scarce effort on analyzing their potentialities in depth and a very small number of studies comparing these potentialities (Silver & Lewins, 2007; University of Surrey, 2017; Wikipedia, 20017). In addition, there are almost no works analyzing self-learning as a possible effective method for learning Computer Assisted Qualitative Data Analysis Software and on how to turn normal software users, or questions' posers/executors, into authors of their own knowledge and participants in the content learning process as co-producers of learning support documents. Thus, this paper reviews the new paradigm of self-learning and its relation to CAQDAS with emphasis on the use of CAQDAS for education research and the self-learning of CAQDAS tools.

The rest of the paper is structured as follows. Section II reviews the new paradigm of self-learning and its relation with CAQDAS. Section III analyses education and CAQDAS with emphasis on the use of CAQDAS in educational research and the self-learning of CAQDAS. Section IV describes the methodology for the study conducted that had as main goals to analyze the self-learning tools of CAQDAS and identify CAQDAS's users profile regarding learning. Section V describes the main results achieved and the following section analyses the user's preference on CAQDAS learning tools and preferred methods to learn CAQDAS. Finally, section VII presents some concluding remarks.

II. Self-learning

We live in times when people are increasingly encouraged to be autonomous in carrying out the most diversified tasks. An example of this is the fact that until very recently it was difficult to imagine that when going to a supermarket people would have to register themselves the purchases made or to supply one's car at a fuel supply. This is the age of "do-it-yourself", where people have autonomy to achieve things that in the past required the intervention of others. As such, the ability

to learn autonomously has become a basic ability, and is increasingly essential in today's world, making self-learning a necessity in the face of the demands of today's society. However, it is important to emphasize that learning to learn requires purpose, effort, discipline and responsibility, avoiding the preconceived idea of being a simplistic, easy and superficial learning process. Learning to learn proves to be an important avenue for progression and improvement of personal and social well-being (Lima Santos & Gomes, 2009).

This new paradigm is also felt in the educational context, more specifically in the learning process, where students (especially those in the higher education levels) are encouraged to develop more autonomous learning skills. In this way the student is challenged to identify a learning need, using the personal resources that he considers most effective, applying them in a systematic and flexible way through his cognitive, social and creative capacities (Lima Santos & Gomes, 2009). An example of this is the emergence of higher education institutions that exclude the role of the teacher and promote collaborative learning, thus allowing students to develop autonomous learning solutions supported by more creative methods (Matt Pickles, 2016).

In this sense, self-learning presents itself increasingly as a competence to support learning in a proactive way. It is sustained by a great sense of responsibility and autonomy, in which the learner creates and self-regulates his own learning path and selects the learning contents he intends to acquire, managing his learning process (Eranki & Moudgalya, 2016; Lima Santos & Faria, 2003, 2007; Magalhães, 2011).

Nevertheless, we may wonder about the real advantages that self-learning can have in the learning process. Some studies stress some of these advantages, first of all, at the level of cognitive competences. Self-learning appears to increase critical superior thinking and questioning skills (Candy, 1991); stimulate confidence and problem-solving ability (Durr, 1992); and promote a "deep learning" experience (Stansfield, 1997). On the other hand, regarding efficiency, there is evidence that self-learning contributes to a better performance in the execution of tasks (Merriam, Caffarella, & Baumgartner, 2007); to establishing a greater commitment to learning (Cho & Kwon, 2008); and greater persistence in the face of obstacles and challenges (Zsiga, 2008). Methodological competences are also influenced by self-learning, by fostering the incentive to pro-activity and autonomy (Lima Santos & Faria, 2003, 2007); as well as in the promotion of collaborative knowledge networks (Rowland, Frances; Volet, 1996).

In addition to being a method by which the student can achieve knowledge, learning independently, self-learning also gives the possibility of an active, free learning that stimulates responsibility and respects the student's learning pace (Rurato, 2008). Thereby, the student takes the initiative to manage his own learning process, harmonizing the knowledge according to his needs, personally valuing his own training (Rurato, 2008). In this sense, the levels of high responsibility inherent in self-learning seem to make this process more suitable for young adults and adults, than for children or adolescents, since these, by their natural immaturity may manifest little capacity for self-discipline in their learning process. Therefore, it will be expected that self-learning will find in the context of higher education, an environment more conducive to its applicability, since it is a learning context less structured and with fewer limitations than other teaching contexts (Moreira, Nejmeddine, & Almeida, 2014).

However, it is in the online context that the term self-learning more often arises, since these environments are very adaptable to the characteristics of self-learning by proposing a broader and more flexible model, thus enabling a variety of modalities of conduction of the learning process (Alonso, Lopez, Manrique, & Vines, 2005). Studies show that virtual environments, based on a design focused on the development of competences, on the principles of constructivism, autonomy and interaction, have very positive effects on learning competences, such as active learning, learning initiative and Autonomy in Learning (Costa & Moreira, 2013).

However, are there prerequisites or innate skills for self-learning? According to Moreira, Nejmeddine and Almeida (2014), for an efficient process of self-learning it is required from the student (mainly in the context of higher education) a high level of self-regulation in order to more effectively manage his/her learning process. Regarding the innate tendency for self-learning, there are important areas of research within adult education area that have focused on identifying and measuring their propensity for adopting self-learning methodologies, such as the "self-directed learning readiness" (Guglielmino, 1977). In addition, other authors identify four antecedents that may influence adult students in the use of self-learning. These are (i) the existence of innate psychological traits that favor autonomous learning; (ii) the possession of technical skills for self-learning; (iii) familiarity with the subject being studied; and (iv) motivation to initiate, continue and complete the autonomous learning process (Brockett & Hiemstra, 1991; Candy, 1991; Merriam et al., 2007).

Based on all these concepts, it is likely that self-learning may be one of the most effective methods for learning Qualitative Data Analysis Software (QDAS). However, the challenge is to understand how to turn software users, or executors of questions, in authors of their own knowledge. Can CAQDAS's users become participants in the content learning process as co-producers of learning support documents?

The reality is that the use of digital tools to support data analysis requires a high technical and methodological knowledge on the part of the researcher. These requirements may sometimes be demotivating. This is especially relevant if we take into account that a considerable number of researchers who use qualitative analysis software packages do so in the framework of their masters and doctoral or postgraduate projects (Freitas, Neri de Souza, & Costa, 2016; Silver & Rivers, 2015), so there is no great time available for learning software. However, the requirements intrinsic to the development of qualitative research (such as the diversity of research contexts, variety of formats, quantity and types of data, etc.) may turn the use of self-learning tools a solution to decrease the learning curve of these applications (Martin, Mitrovic, Koedinger, & Mathan, 2011). In this way, the researcher would reduce the time spent in learning, and add it to his/her productivity.

III. Computer Assisted Qualitative Data Analysis Software (CAQDAS) in Education

When we address education and CAQDAS, two thoughts arise: i) the use of CAQDAS in educational research and ii) the learning of CAQDAS. We will try to cover both to enlighten the reader.
As can be read in this paper CAQDAS came to revolutionize how data analysis is done in qualitative research. They contribute greatly to the rigor and credibility of qualitative research carried out.

Nowadays it's assumed that qualitative research will be hampered when dedicated software is not used, for example in the technique of content analysis, perhaps the most used in this research approach, the use of general productivity tools will not impede the data interpretation, but it can be improved with a software designed specifically to maximise this process (Freitas, Ribeiro, Brandão, Souza, Costa & Reis, 2018; Bardin, 2013).

As known, qualitative research was boosted by social sciences although it is currently transversal to several scientific areas (Chizotti, 2006). One of those areas is education, area of interest of society in general and in particular of those directly involved, who seek to know the whys, who want to do more and better and, above all, to perceive the uniqueness of the phenomena in its socioeconomic, temporal and physical contexts. The education of students and teacher training move several researches, which often take the form of case study or action research (Nath, 2005).

These research designs produce a massive amount of raw data such as interviews, focus groups and observation, that require rigorous and in-depth analysis, which can even be achieved manually in the hands of an experienced researcher. However, in the vast amount of research that pursue an academic title, certainly will only be achieved resorting to facilitating tools such as CAQDAS (Ribeiro, Brandão & Costa, 2016; Costa, Faria & Reis, 2016). Manual processing can be combined with CAQDAS, which provides a closeness with the data that leads to the development of credible and defensible conclusions (Souza, Costa & Souza, 2015).

A basic justification for using CAQDAS is their ability to optimize data reduction, easy coding and enhanced ability to access and explore the data and the analysis made (Reis, Costa, & Souza, 2016). There is a perceived swiftness, preciseness and effortlessness afforded by the simple clicking, dragging of context and registry units into categories and, accessing their original sources in CAQDAS such as webQDA, compared to paper pencil and highlighters, and even with spreadsheets or word processor tables. Appropriating the words of Sohn (2017, n.p.) we also consider "Getting bogged down in quantities and the nitty gritty details of coding can take unnecessary time and effort, and can prevent the researcher from gaining a sense of the whole of a phenomenon". Nevertheless, it must be beard in mind that, as experienced researchers know, no software program will do the analysis automatically and that it is a non-delegable task, requiring the constant proximity of the researcher.

Software packages dedicated to qualitative research support can enable:
1. organization of the data collected (particularly when dealing with a high volume of data);
2. systematization and analysis of data;
3. definition of analysis dimensions, categories and subcategories;
4. visual modelling and representation of concepts and theories in the research.

Although the use of software makes it possible to improve processes in response to research questions, it does not replace the analytical competence of researchers. It should not automatically interfere with the actions and reflections of the qualitative analysis, observing that the rigor and quality obtained will be truly achieved with the adherence to criteria defended in the literature for the conduction of a qualitative approach (Costa, Souza, & Reis, 2015).

Advantages in Adopting CAQDAS	Limitations on Adoption of CAQDAS
It allows approaches of different methods, such as mixed methods.	CAQDAS packages are very complex; need a lot of time and effort to know the specific features and functions.
Speed and consistency in data analysis.	Dictionary entries/categories not sufficient for language-in-context.
Structured outputs and feedback of analyzed data (word, phrase, category, code count, matrix, search etc.)	Limited automated coding processes; Manual encoding required.
Codes can be organized hierarchically and modified and mobilized during coding and analysis. Possibility of crossing and overlapping codes of the most infinite forms.	Analysis of in-depth content (semantic analysis) hardly possible with large data.
The inter- and intra-coder reliability tests can be performed.	Most CAQDAS are paid leave and somewhat expensive.

Table 1. Presents pros and cons of CAQDAS use.
Adapted from: (Einspänner, Dang-Anh, & Thimm, 2014)

Returning to the specific use of CAQDAS in education, we call attention to the use of software as a pedagogical tool for learning the process of data analysis of qualitative research. Most of this paper authors are lecturers and have realized how they could blend the learning of data processing with the learning of dedicated software, observing greater ease on the part of the students in the understanding of the theory and process of qualitative data analysis. This thought was already addressed in 2003 by Walsh (and probably by many others) who saw that with the use of QDA

> "The coding system is a way of labeling certain aspects of your data and sorting the information into distinctive categories. It is an easy way of keeping track of your ideas as well as documents about specific topics. Coding lets you use words, phrases, and ideas directly from the text and you can, capture information about things (such as how someone was feeling, when something happened) and explore them further when you decide it's time." (p.254)

This paraphrase illustrates not only the contact of students with a CAQDAS functionalities, but also with the process of exploring and analyzing the data itself.

Whereas, Holbrook and Butcher in the early 1996, alert for the diversity of backgrounds of the researchers, particularly education researchers and the need for previous research methods learning before contacting with CAQDAS.

Julius (2012) points out that there is more to learn that only its processes and technical issues. In his review, he highlights that it is also to know how the used research methodology relates to the tools the software has. The author also states that it may be useful to combine software learning with the learning of research methodologies, but it requires changing teaching practices, which should be more reflexive and wherever possible associated with student research projects.

IV. Methodology

This study has two goals: (1) to analyse the self-learning tools of Qualitative Data Analysis Software; and (2) to identify CAQDAS's users learning profile.

With regard to the first objective, it was adopted a methodology that favoured the identification, registration and analysis of CAQDAS tools related to the self-learning process. Six software packages were selected: NVivo, Atlas.ti, Dedoose, webQDA, MAXQDA, and QDA Miner. They were then reviewed, taking into account, among other criteria, their transversality in terms of: operating systems; type of access (Desktop or Web); language in which they are available; and typology of licenses. Considering (self-learning) tools, the offers available for the various packages were analysed with regard to: User Manual; Methodological Manual; Tutorial Videos; Frequently Asked Questions (FAQs); Forum; Blog; Training; Workshops; Webinars; Consulting; or other tools. These data were identified through a systematic search in the software's websites.

In a second phase, and with the aim of complementing the revised data, attention was focused on one of the self-learning tools - the forums. It was conducted a corpus analysis of the internet data (Hewson, Yule, Laurent, & Vogel, 2003; Neri de Souza & Almeida, 2009) with the objective of carrying out a second analysis of the data existing in the forums of the various software packages. Given the large volume of data corpus existing in these forums, it was decided - for a better systematization - to only analyse the topics regarding the last month prior to this study.

A total of 114 messages from users, trainers, moderators, authors of user manuals and technical support of the forums of the packages were analysed. Of these 114 messages, 62 belonged to NVivo, 25 to Atlas.ti, 12 to webQDA, 11 to MAXQDA and four to QDA Miner. Dedoose forum messages were not analysed since it was disabled at the time of the study.

Analysis Dimension	Analysis Categories	Comments
Type of questions	Executive Issues	Allusive to all questions related to doubts for the execution of a certain action or process in the course of using the software
	Methodological Issues	Concerning doubts regarding the sequence of actions (codification, matrixes, functionalities, etc.) more appropriate to specific projects
	Technical Issues	Concerning all questions associated with anomalies (system bugs, etc.) arising from the execution of operations

Table 2. Dimension and Categories Analysis of forums.

In Table 2 we can see the dimensions and categories analysis of forums. In dimensanalysis of the latent data of the Internet, three areas were focused: i) the typology of questions posed by users; ii) answers with instructions from the trainers, moderators, technical support or authors of user manuals; and iii) suggestions for improvement, referenced by users, to be introduced in the analysed packages.

Regarding the typology of questions posed by users, three categories were defined (Table 2): i) "Executive Issues", allusive to all questions related to doubts regarding the execution of a certain action or process in the course of using the software; ii) "Methodological Issues", concerning doubts regarding the sequence of actions (codification, matrixes, functionalities, etc.) more suitable to specific projects; and finally (iii) "Technical Issues", concerning all questions associated with anomalies (system bugs, etc.) arising from the execution of operations.

Regarding the second area focused, the answers to the questions asked in the forums, the instructions given were considered, and if the questions were answered in the forum itself or if they referred to other sites. Collaborative answers were also analysed, that is, the answers given by users in support of questions posed by other users as opposed to forum moderators or technical support elements.

Finally, regarding the third area focused in the analysis of the latent data of the Internet, some of the messages that contained proposals for improvements were analysed considering: i) usability; ii) support; iii) instructional clarity; and iv) technical matters. The "usability" proposals refer to the improvements needed for a more efficient use of the software, while the suggestions of "support" concern the need for improvement in the support to the users. "Instructional clarity" is related to improvements in the instructions (text or figures) of the steps to be performed, whilst "technical issues" point to functionalities, or technical procedures, which the software should provide. The analysis of the suggestions messages in the forums was aimed at understanding the needs of users who were not effectively answered by the self-learning tools provided by the various packages.

The analysis of the messages of the forums was based on the collection from the considered forums, later placed and organized in a CAQDAS software, where they were qualitatively analysed. Regarding the second objective of the study, the identification of CAQDAS's users learning profile, an online questionnaire was applied, using Google Forms. The questionnaire was validated by four researchers from the area of educational technologies and two users of CAQDAS. It consists of 29 questions grouped into five areas: i) characterization of the respondents; ii) characterization of the CAQDAS package they use; iii) learning habits of CAQDAS; iv) usability and user experience of CAQDAS (self)learning tools; and v) usability expectations in a CAQDAS (self)learning platform. For this study only the answers to the questions regarding the learning habits of CAQDAS were taken into account.

The sample is composed of 114 users from different parts of the world, using different CAQDAS packages. Fifty four per cent of respondents (n=62) were women and 46% men (n=52). In terms of ages, 16% (n=18) were between 20-30 years, 38% (n=43) between 31-40 years, 29% (n=33) between 41-50 years, 16% (n=18) between the ages of 51-60 years and 1% (n=2) between 61 and 80 years. As to the level of academic education, 43% (n=49) are conducting a PhD, 30% (n=34) hold a PhD, 9% (n=11) hold postdoctoral studies, 4% (n=5) are conducting postdoctoral studies, 3% (n=3) hold a degree and another 3% (n=3) are taking a master's degree.
In the next two sections, the results regarding the study's goals are presented.

IV. Self-Learning tools of Qualitative Data Analysis Software Packages

In the current context of rapid technological progress and commercial competition, CAQDAS package developers look at the technical capabilities of their competitors, seeking to integrate them (adapting and refining) into new versions of their software (Gregorio, 2011). Hence, current software packages do not greatly differ regarding the level of the functionalities that they deliver. The biggest contrast between CAQDAS packages may be essentially the cost of licenses and the difficulties associated with usability and learning (Pinho, Rodrigues, Souza, & Lopes, 2014).

Table 3 presents, in a general way, the list of existing self-learning tools in the six analysed packages, considering the latest versions of the applications at the date of this study. In the following sections the tools analysed are discussed in terms of their function and assistance in the various CAQDAS packages, with a more extensive exploration of the data collected from Forums.

Tools	NVivo	Atlas.ti	Dedoose	webQDA	MAXQDA	QDA Miner
User Manual	- User Manual (Paper, PDF and HTML)	- Quick Use Manual (PDF) - User Manual (PDF)	- User Manual (HTML; PDF)	- Manual de Utilização Rápida (PDF)	- Quick Use Manual (PDF); - User Manual (HTML, PDF)	User Manual (PDF)
Methodological Manuals	√	-	-	√	√	-
Video Tutorials	√	√	√	-	√	√
FAQs	√	√	√	-	√	√
Forum	√	√	-	√	√	√*
Blog	√	√	√	√	√	√
Training	√	√	-	√	√	√
Workshops	√	√	-	√	√	√
Webinars	√	√ (free)	√	√ (free)	√	√ (free)
Consulting	√	√	-	√	√	√
Other Tools	-	Resources for methodology classes	-	Methodological E-books	MAXQDA Analytics Pro	-

* Available only in a LinkedIn closed group

Table 3. List of self-learning tools in the analysed CAQDAS packages (Freitas et al., 2017).

a. User Guides and Methodological Guides
According to the analysis made, it is possible to verify, as it would be expected, that all the packages provide a manual to the users. The User Manual turns out to be one of the resources that the users most resort to in case of doubts in the execution of some task (Freitas et al., 2016), so it is not surprising that it is available in various media (paper, PDF and HTML). However, it is

noticeable the increasing lack of interest of CAQDAS developers in producing User Manuals on paper, so that of the six packages analysed, only NVivo still provides paper manuals (see Table 3). In addition to the User Manual, the Methodological Manuals present themselves as excellent (self-learning) instruments, contextualizing procedural indications with methodological orientations, thus creating a complement that can more effectively help the user's understanding the "how" and "when" to use specific procedures while resorting to the software. This idea is supported by some authors (e.g., Silver & Rivers, 2016) who consider that the effective use of CAQDAS is related to the methodological awareness, combined with the expertise in the techniques of analysis. Of the six packages analysed, half provide these contents (i.e., NVivo, webQDA and MAXQDA). It should be noted that in the case of webQDA, the Methodological Manual is available in several thematic e-books (Case Study, Content Analysis, Reflective Interview, etc.).

b. Tutorial Videos

As with User Manuals, Tutorial Videos are among the most commonly used features when doubts emerge during the execution of processes using the software. According to Moudgalya (2014), the main reason for the wide acceptance of Spoken Tutorials is the self-learn capability. All the analysed software packages provide videos organized by themes, thus enabling a more assertive and clear consultation of how to perform specific operations. It should be noted that, in the case of Dedoose software, the Tutorial Videos are part of the User Manual in HTML format, complementing the existing step-by-step instructions. In the remaining packages, with the exception of webQDA, the tutorial videos are made available on YouTube channels (in the case of NVivo) or in specific links on the internet pages of each software.

c. FAQs

Frequently Asked Questions (FAQs) are presented as a solution to the most general and frequent questions of users. This is an efficient way for CAQDAS packages to be able to "answer" to users' questions without requiring an individualized, personalized support. Similarly, the analysed packages tend to have the FAQs tool. However, its generalist nature may prove to be inefficient in situations of more specific doubts.

d. Blogs

One of the good resources for self-learning related to methodological issues is blogs. All analysed packages provide their users with blogs with diversified information.
Blogs can also be viewed as a platform where the various CAQDAS packages publicize and promote the capabilities and tools of their applications through demonstrations or sharing of studies conducted by other researchers. In this sense, blogs can present themselves as a valid tool for self-learning, providing the user with valid demonstrative resources on how to develop a research project using a specific software.

e. Training, Workshops, Webinars and Consultancy

The self-learning tools mentioned above are characterized by being asynchronous, thus limiting the interaction of users in case of doubts or difficulties in the execution of a particular operation. The trainings, workshops, webinars and consultancies, appear as synchronous resources, allowing a greater involvement and intervention of the user in the learning process. It may not make much sense to speak in self-learning in the context of training, workshops, webinars or consulting, but rather in learning, since these environments essentially privilege transmissive teaching, and may be somewhat devoid of exploratory element on the part of the user.

Of all the analysed packages, Dedoose was the one that revealed greater shortage of offers at this level, not referring to training, workshops and consultancy in its webpage, and identifying only the offer of webinars. With regard to the remaining packages, all offer this range of training services in full.

Training and consultancy, due to the content presented and the number of hours available, can be presented as more consistent solutions for the acquisition of knowledge. However, they are paid services, which in some situations may be a deterrent to user learning. As an option, some software packages (e.g., Atlas.ti, webQDA and QDA Miner) run free webinars as a way to make their products known, their potential and in some cases methodological demonstrations with the use of their applications. In other situations, workshops are promoted, which may, in some moments, be equally gratuitous.

f. Forums analysis

As mentioned above, this research used the forums of the CAQDAS packages in order to collect data complementary to the information described above. The data corpus provided in the forums presents itself as the only content available on the pages of the CAQDAS packages that allows identifying the real difficulties and doubts of the users of the various packages.

The first dimension analysed concerns the typology of questions that the various profiles of users place, looking at the motivation with which they ask for help. In Table 4 it can be seen that 46 out of the 83 questions in the forums are related to executive issues, that is, how-to-do questions. This reveals that, on more than half of the forums' questions, users are looking for solutions that answer the "way" to perform specific actions: *Is there a way to use linked documents in the Mac version?"* (ATLAS.ti user); *"Could you let me know how i can quickly see how many nodes I have? Also how many documents I have. I know its very basic but I don't seem to be able to find/see this very quickly. Many thanks"* (NVivo user).

Type of User	Type of Questions		
	Executive Questions	Methodological Questions	Technical Questions
Basic	44	13	23
Trainer	1	0	0
Advanced	1	0	1
Total	**46**	**13**	**24**

Table 4. Questions placed in the forums according to the type of user.
Source: Freitas et al. (2017)

The users who place the questions are characterized by being almost entirely users with Basic profile, with only two references to advanced user questions. An interesting fact to note is that CAQDAS packages trainers also turn to forums to ask questions about executive issues: *"(...) Does anyone have a way to do this at the moment you need to click between the two documents from OPEN ITEMS there is no tab as there is in WIN version but actually being able to view side by side would really help. Any suggestions or work arounds people can suggest?"* (NVivo Trainer).

Issues related to technical anomalies (24 references) also occupy a good part of the messages list of the forums: *"I am currently running NVivo 11.2.1.616 Windows 64-bit on a computer with a high-resolution display (MacBook Pro Retina 15", Windows 10 Home 64-bit, Apple Boot Camp). The display is currently set at 175% scaling. The fonts and graphics in NVivo 11 do not appear to scale with the resolution settings, with all UI elements appearing blurry."* (NVivo user).

Besides the questions posed by the various users, it seems relevant to identify to which CAQDAS packages these questions pertain. Table 5 shows that, for NVivo and ATLAS.ti users, there is a high balance between executive and technical issues. This data suggests that the users of these packages are those who most feel difficulties related to the technical side.

Another relevant issue concerns the questions of methodological forum. Although the forums are spaces made available by the various CAQDAS packages for the sharing of ideas and doubts of this nature, of the 83 questions analysed, only 13 questions were regarding methodology. And the users of webQDA are the ones that ask more questions (7) when compared to the other packages. The problem of the apparent misuse of the forums may also be due to users who, instead of reporting technical anomalies in more appropriate spaces, use forums. However, in many cases these are designed to discuss only issues of methodological nature and execution of procedures: *"Thank you for the suggestion, but please remember that the forum is not a support channel as such. It is a platform for users to discuss "how to" and methodological questions. For actual technical problems or questions, it is best to contact our support directly. Hope this helps. All the best"* (ATLAS.ti moderator).

User's packages	Type of Questions		
	Executive Questions	Methodological Questions	Technical Questions
NVivo	19	5	14
Atlas.ti	11	0	9
webQDA	9	7	0
MAXQDA	5	0	1
QDA Miner	2	1	0
Total	**46**	**13**	**24**

Table 5. Typology of questions placed according to the CAQDAS packages users.
Source: Freitas et al. (2017)

After the analysis of the types of questions posed by the various users of CAQDAS packages, the responses that the moderators, technical support and authors of user manuals present in the forum were considered (see Table 6). The analysis sought to explore whether user's questions were actually answered in the forums, or if, instead, other solutions were suggested to resolve doubts. Sixty-seven responses were analysed, and categorized by the "location" of resolution or instruction presented. It should be noted that the apparent discrepancy between the number of questions asked (83) and the number of responses analysed (67) does not mean that there has been a lack of response from the moderators. This is due to the existence of several similar issues in some topics, sometimes resulting in a single response from the moderators.

As would be expected, most of the questions (38) were answered directly in the forums, and no CAQDAS package left unanswered questions. The only answers that redirect the user to the help pages (15) refer to NVivo software. This is better understood if we recall that the NVivo forum is the one that presented a higher index of technical issues (see Table 4), hence, it is understandable that NVivo's moderators redirect users to the "Help" pages. However, it should be noted that in some cases these "referrals" functioned more as a complement to the responses presented in the forums: *"You can find some more details about auto coding by source style or structure at the following link:* http://help-nv11.qsr...ent_sources.htm*"* (NVivo moderator).

Another interesting fact is the small number of answers that refer to FAQs. This seems to highlight the unique nature of users' doubts and the role of forums as privileged spaces for acquiring learning, by not referring users to an environment of predefined answers, and investing instead in a more personalized response.

Packages	Answers to User Questions							
	Answers in Forum	Answers with links from Forum	Refer to Support	Refer to the User Manual	Refer to webinars	Refer back to external websites	Refer to the Help page	Refer to FAQs
NVivo	21	1	4	0	0	0	15	1
Atlas.ti	6	0	2	0	0	0	0	0
webQDA	5	0	0	1	0	0	0	0
MAXQDA	5	0	3	0	0	1	0	0
QDAMiner	1	0	0	0	1	0	0	0
Total	**38**	**1**	**9**	**1**	**1**	**1**	**15**	**1**

Table 6. Answers to user questions per CAQDAS package.
Source: Freitas et al. (2017)

Table 7 presents the collaborative responses per CAQDAS package. That is, when a user (other than the forum moderator) takes the initiative to answer a question posed by another user, as a way to help him/her in his doubt. Of the 114 messages that were analysed[1], only five corresponded to collaborative responses. This data is of special interest if one takes into account that, for some CAQDAS' users, resorting to more experienced users in case of doubts is the second most frequently used option, after consulting the User Manual (Freitas et al., 2016). Though, given the modest number of collaborative responses collected, it seems clear that forums are not yet an alternative for users who favour a more collaborative learning. This may be due, in all likelihood, to the rapid and expectant responses from the technical support and forum moderators, which may discourage the input of other users. This may also be due to the fact that users access the forums in order to see their questions answered, not getting involved in the doubts and difficulties of other

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[1] Remember that only 83 of these messages presented questions; others were comments, etc.

users. However, this situation seems to detract somewhat from the concept of forum as a collaborative learning environment (Oliveira & Morgado, 2012), making it a space that most resembles technical support.

Packages	Collaborative Answers
NVivo	2
Atlas.ti	3
webQDA	0
MAXQDA	0
QDA Miner	0

Table 7. Number of references of collaborative responses per CAQDAS package.
Source: Freitas et al. (2017)

Finally, some suggestions for improvements mentioned by users in some CAQDAS forums messages were considered. It seemed pertinent to see if these messages presented suggestions or requests related to instructional or learning improvements. Of the 83 questions analysed, 16 mentioned suggestions for improvements (e.g., *"It would be fantastic if NVivo were able to more easily recognise the formatting/syntax of .srt files."*, Nvivo user), all presented by basic users. Suggestions of technical nature were the ones that were mentioned the most (Table 8).

It is curious that in 16 references to improvements, there is only a suggestion regarding the clarity of instructions. This suggests that, at this level, the CAQDAS packages analysed seem to respond to the instructional needs of their users: *"I suggest that the illustration on p. 45 is misleading as it indicates 2 hard returns in between the two paragraphs of Alexander's long comment. The summary on p. 47 is much clearer."* (ATLAS.ti user).

Type of user	Improvement suggestions			
	Usability	Support	Instructional Clarity	Technical
Basic	4	1	1	10

Table 8. Number of references to suggestions for improvement by users.
Source: Freitas et al. (2017)

V. CAQDAS's users Learning Profile

In this section the data collected from CAQDAS' users is presented (N=114) regarding preference on CAQDAS learning tools (e.g., Training sessions) and preferred methods to learn CAQDAS (e.g., learn in groups).

Let us first consider CAQDAS users preference learning tools. As Figure 1 shows, when we take into consideration the data regarding the "agree" and "totally agree" simultaneously, the Tutorial Videos, User's Manual, and Training Sessions tend to be the preferred tools for participants to learn CAQDAS. The least preferred tools are the Consulting Sessions, probably because to resort to them requires a financial investment from users.
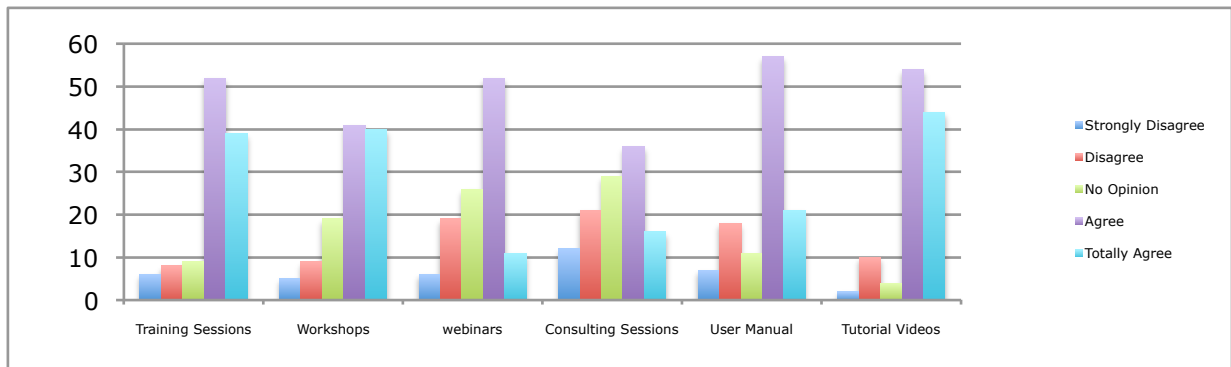
Figure. 1. CAQDAS Preference Learning Tools

Regarding the methods that participants prefer to use when learning a CAQDAS, data shows that exploring the software and to learn independently are the preferred ones (see Figure 2). This suggests that users tend to prefer a hands on approach, learning the software while using it, likely (we believe) in their own research project. Also interesting is to see their preference for the method of consulting step by step instructions, which refers us to the User Manuals, which have already been addressed as a tool that CAQDAS tend to make available for users. These results point to the importance of software companies continuing to invest in this specific tool, making it available to users.

Despite being used, the method of learning CAQDAS in groups seems to be the one which participants less prefer. In fact, here is where we find more participants saying that this is not a method used by them. This reinforces the perception of the process of learning to use a CAQDAS as an individualized, mainly autonomous and, it seems, solitary process. This may resonate with the experience of most part of researchers when conducting research. Research tends to be a solitary process; this is particularly the case with PhD projects, which is the context where many researchers first contact with CAQDAS.
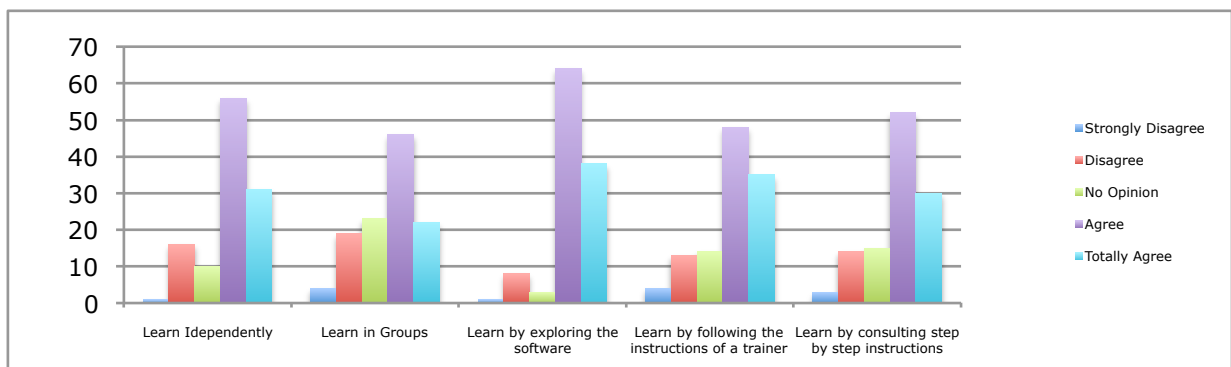

Figure. 2. Preferred methods of CAQDAS learning.

Given that learning to use a tool requires different competencies, which will differ if you are doing it as a student (or junior researcher) or a supervisor (Salmona & Kaczynski, 2016) or an autonomous/senior researcher, future analysis should explore these data according to the participants' role (e.g., student vs senior researcher).

VI. Final Considerations

When searching for the self-learning tools of the various CAQDAS packages, as well as the various messages present in the forums, there are few disparities between the packages with regard to their self-learning tool proposals. As with technology resources, the learning features offered by the analysed packages are all very similar, covering almost all dimensions. The only two safeguards relate to autonomous learning and formative learning, with Dedoose presenting some limitations at the formative level and webQDA revealing more limitations regarding the provision of autonomous learning tools.

It is also noted that CAQDAS users present more questions related to the execution of tasks, to the detriment of issues regarding methodology, which are placed on a third level, behind technical doubts. This suggest that, as far as CAQDAS learning is concerned, users feel more compelled to look for information on how to work with CAQDAS in their specific research projects (hence, looking for contextualized information), than to know the methodologies that support and justify the performance of certain CAQDAS operations. This may be due to the fact that users view the CAQDAS learning support platforms only as a technical support rather than as methodological guides, leaving that part to be consulted in other sources of information. On the other hand, this result is consistent with the preference of CAQDAS users regarding User Manuals, Tutorial Videos, Webinars and Trainings Sessions. And is also coherent with what seems to be an individualized and contextualized way of learning to use CAQDAS. There seems to be a contextual or context-based learning, where the context is the research project the researcher is undertaking at a given moment. CAQDAS users seem to learn to use a specific qualitative data analysis software while conducting a specific research project. They explore the software while developing the research project (particularly with regard to the analysis of data), looking for answers regarding "how to" or the "way to", making use of forums and other available tools to get answers to the questions that arise during that process. These are, therefore, questions directed and contextualized. That is, questions and doubts anchored in the user's research project. This seems to result in a learning process closely associated with research. This is, in fact, something that was experienced by most of the authors of this paper. We believe users access methodological support resorting to classes, methodology textbooks, supervisors and other researchers, using CAQDAS in an instrumental way, which is, in supporting a research that already has a specific methodological frame. In fact, the integration of methodology and CAQDAS is somewhat scarce in several arenas, such as textbooks or designing research projects. Nonetheless (and maybe because of that) methodology lecturers and CAQDAS trainers[2] have come to highly appreciate handbooks and papers that consider both methodological aspects and software procedures, demonstrating how a software may be used to conduct a specific research and analyses (e.g., Brandão & Miguez, 2016). In our practice, we have

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[2] And most of the authors of this paper teach methodology courses.

come to increasingly combining both dimensions, given the gaps we have been identifying in junior researchers and the learning potential underlying the conjugation of methodology approaches and CAQDAS. This approach enables to combine dimensions fundamental to the learning process. Moreover, it allows that CAQDAS users are able to resource to software learning tools in a much more informed and competent way, as they become more aware regarding the connection between the software and research methodologies. They become more effective in the use of CAQDAS learning tools and particularly (and more important) better researchers. The data presented in this paper may have been subject to some limitations. First, the restricted sample of CAQDAS packages subject to analysis, as well as the latent data from the forums, which reproduce only one month of records. However, it reveals that there is a considerable demand for information from users regarding the execution of processes in CAQDAS, and that the various packages analysed, although presenting a very diverse range of learning offers, do not guide the user towards the self-learning tools that best fit his/her learning style. Also, data collected from CAQDAS users was not analysed according to the user's profile. It will be important to consider if these users prefered learning tools and methods are associated with their role. That is, if the participant uses CAQDAS as a junior or senior researcher or even as a supervisor.

It is concluded that it would be pertinent to continue to develop research that seeks to systematize CAQDAS self-learning tools in order to articulate them with the learning styles of the users of CAQDAS packages. These studies could result in knowledge that could guide CAQDAS developers to develop adequate learning tools, which consider the existence of different learning profiles and each user learning profile. It would also provide users with a more effective and efficient experience in self-learning qualitative analysis software packages.

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