

# Scientific Rigor In Determining The Sample Size In Qualitative Research

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## Abstract

According to Sujan (2023), scientific research is the process of finding facts or solutions to problems systematically, experimentally, and logically. It's a process that always remains purposive and comprehensive. It is a "systematic, empirical, and critical investigation of propositions about the presumed relationship among the variables (Kerlinger 1973)." It is not undertaken based on someone's intuition, experience, and estimation, instead, it is always comprehensive and objective in nature. That is why it is a careful critical enquiry or examination in seeking facts or principles; diligent investigation in order to ascertain something. With the discovery of new facts, old conclusions or theories may either be rejected or modified. Research is necessary to examine the extent of the validity of the old conclusions or to find out some new facts and generalisations in connection with the existing ones. Thus, it purports to give a new direction and a new insight into the existing problem. Needless to say, a research must be based on some problems or some facts (Gavin Wright and Tréa Lavery 2023). Inquisitiveness and dissatisfaction are the two main building blocks of any research. In a progressive science, the generalisations may not hold good beyond a certain time-period. With the passage of time, facts may change, the problem itself may undergo change and so also the concept. Thus, a constant search and research become essential to know the exact truth. The research may establish new empirical generalisations and falsify the old ones (IEREK Conferences 2019). Thus, new theories are constructed. Therefore, it could be said that scientific research is a process of arriving at dependable solutions to problems through the planned, scientific and systematic collection, analysis and interpretation of data (Ceyda Özhan Çaparlar and Aslı Dönmez 2016). It is a systematic, scientific, process of collection, analysis and interpretation of data in order to increase someone's understanding of the area of interest. Generally, scientific research is conducted to solve problems. It analyses all the dimensions of the problem systematically and finds out the natural causes of the problem, collects, and interprets the data, and finds out the solutions to the problems. Since scientific research is conducted in order to resolve a problem, one cannot resolve a problem through untruthful means. Therefore, scientific research is an honest, exhaustive, intelligent, systematic, scientific search of facts and their meanings or implications with reference to a given problem. That is why research simply means a search for facts – answer to questions and solutions to problems (Gavin Wright and Tréa Lavery 2023). Research is indeed a purposive investigation. One cannot conduct scientific research by fishing aimlessly. Hence scientific research is an organised inquiry. It seeks to find explanation to unexplained situations, to clarify doubtful propositions and to correct misconceived facts (Sujan 2023). It is a systematic collection, analysis and interpretation of data to answer a certain question or solve a problem. It is a careful, critical enquiry or examination in seeking facts or principles diligent investigation in order to ascertain something (Gavin Wright and Tréa Lavery 2023).

So the objective of this research is to find a scientific rigor that is air tight of arriving at a sample size in qualitative research. In most of the universities, including the University of Zambia, some students arrive at the sample size as if it was a matter of divine intervention. The study applied a qualitative method by conducting a content analysis of some of the postgraduate dissertations. This research applied the purposeful/ judgemental sampling techniques because the researcher knew the target group. The researcher read through the first three chapters of the protocols. The findings are that there is a weakness when arriving at the sample size. Not even in qualitative is it allowed not to be scientific and just use guess work, personal volition or divine intervention. It is these findings which have led the way to knowing and recommending the best ways to arrive at the sample size.

Keywords: sample size; adequate sample; qualitative research; saturation; purposive sampling;

## Introduction

Qualitative research is commonly used in the humanities and social sciences, in subjects such as anthropology, sociology, education, health sciences, history, communications, gender, law, psychology, literature and languages, etc. According to Pritha Bhandari (2023), qualitative research is a process of naturalistic inquiry that seeks an in-depth understanding of social phenomena within their natural setting. It focuses on the "why" rather than the "what" of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their everyday lives. Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research. Furthermore, Jackson, Drummond and Camara (2007) add that qualitative research is primarily concerned with understanding human beings' experiences in a humanistic, interpretive approach. Issues of research design differences between quantitative and qualitative research are traced with an emphasis on identifying diverse methodologies, including those focusing on analysis of text, and diverse forms of data collection along with criteria for evaluating qualitative research. Given that qualitative inquiry is based on communication—on the collection of stories, narratives, and descriptions of others' experiences—the fact that so little is generally known about what qualitative inquiry is appalling.

Qualitative research could also be defined as an approach to the study of human behavior that relies on the analysis of narrative data to create an interpretation of the meaning of these behaviours from the perspective of the participants themselves, within their own social context. Put more simply, qualitative researchers go into a particular setting such as a nursing home, clinic, or community, and, over time, they watch, listen, ask questions, take notes, and try to understand as fully as possible how persons in that setting see and experience their world. Thus, qualitative research requires the researcher to be engaged in the lives of the people studied—to hear their stories, grasp their point of view, and understand their meanings. Through interviews, study participants vividly describe their experiences and perspectives to the researcher. Through observation and participant observation—that is, by “being there”—the researcher sees what actually happens in a given context, analyzes these social events, and interprets them for a larger audience. However, the numbers do not tell anything about the quality of those interactions, nor how the resident experiences them. It is the latter perspective the qualitative researcher seeks to obtain (Kuckelman and Forbes 2002).

Qualitative approach is becoming a more prominent method in carrying out scientific researches in social sciences, education sciences, healthcare, business, management studies, organization studies, management and assessment of social welfare programs. For instance, more qualitative research was published in the American top-ranked management magazines during the first decades of the 21<sup>st</sup> century than in the last 40 years (Rijnsoever, 2017). In order to trust the out-puts of qualitative studies, and to know that it is an exact, solid, fine scientific research, it is assessed against certain criteria, just as in quantitative researches. The criteria used for assessing qualitative studies should be consistent, to some extent, with the traditional ones (validity, objectivity, generalization), yet they should be alternative (Malterud, 2001). The alternative standards of assessing exactness, quality, reliability of the qualitative research output, are credibility, confirmability and transferability. Credibility or reliability of research output match the internal validity from the quantitative study. Confirmability coincides with objectiveness and transferability coincides to universalizability. Malterud deems reliability as an essential standard of the qualitative research exactness (2001). We need to know that the research output is reliable (Fossey et al., 2002), and this standard offers this very possibility. Transferability is a key component of qualitative research, which provides the opportunity to establish whether the research output can apply to other contexts or not. When assessing the exactness of a research, notwithstanding whether it implies a quantitative, qualitative or combined approach, we pursue a detailed description of the entire investigation approach carried by the researcher, including the sampling strategies. Considering the emergent nature of this type of research, many researchers reason whether the sample size matters or not. Most qualitative studies are run on small samples (Sandelowski, 1995), as the researches made on 10-respondent samples are quite usual (Lichtman, 2010). Sandelowski (1995) notices the established practice of an aesthetical principle when appraising a sample size: “...small is beautiful”. Patton (2002) recommends that qualitative research sample sizes should reasonably cover the studied occurrence, depending on the purpose of the study and the points of interest for stakeholders. In other words, a sample should be proper. According to Vasileiou et al., (2018), its appropriateness is expressed by the composition's appropriateness (cases, units rich in information) and sample size (proper data for fully explaining the occurrence – quantity, quality). Therefore, numbers are important, as well. Thus, sample size becomes a key consideration when assessing the output quality and reliability for many qualitative researches, or, as described by Vasileiou et al., (2018), “a key quality marker of qualitative research”. Decisions on the number of units included in a sample can be a priori or a posteriori made – through an adaptive approach, by

reference to saturation (Sim et al., 2018), yet the size should be proper and sufficient for explaining the studied occurrence, irrespective of the sampling method used.

## Statement of the Problem

The author of this article has been a lecturer at the University of Zambia since 2011 with many years of lecturing Qualitative Research Methods. Apart from that he has been an Assistant Dean Research in the School of Humanities and Social Sciences (HSS) and above all he is the Vice Chairperson of the Research Ethics Committee for the School of Humanities and Social Sciences which comprises of the School of Education, Law School and of course HSS. Experience shows that when it comes to calculating the magical number of the sample size in qualitative, everyone wants to know how it has been worked out. For a lot of people, they arrived at the sample size almost like divine intervention or magic or personal volition. Not scientifically very convincing and it attracts some rebuttal from those who are in the quantitative sector. Unlike quantitative research projects, there are few formal statistical guidelines governing the design and execution of a qualitative research study. Best practices regarding randomness, confidence intervals, margins of error, and estimations for sample size needed are not standardized for qualitative research. Ultimately, these decisions are arrived at either by default or are simply chosen more based on intuition and past experience and not based on any known formula (How to Estimate the Sample Size You'll Need for Qualitative Research (cfrinc.net), viewed on 30/09/2023). According to Daniela Rusu Mocănașu (2020), most researchers carrying out qualitative researches have no consensus with respect to the exact size of a proper sample. For some authors, the count of investigated units is irrelevant when they assess the sample size's adequacy, as they emphasize the abundance of data submitted by the units included in the sample.

The question of how large, logical and scientific a sample should be in qualitative research is the debate this article is looking at. Analysing the professional literature, through the experience of the author of this article, one would safely say that there is no consensus of methodologists and practitioners with respect to sample size – which vary between 1 and 350 units included in a sample, its size depending on a plurality of factors – scope of research, type of approach, epistemological attitude, researcher's experience, the place or university where the research is conducted from, financing, time, perception of study assessors' expectations, etc. The author of this article has handled more than five hundred (500) protocols and can attest that there are variations in the used sample sizes for qualitative research specific types as well, from one researcher to another. The truth is that there are no general numerical directions in qualitative research (Guest et al., 2006: 60), clear rules or methods guiding the researcher how to obtain a properly sized sample (Kindsiko & Poltimäe, 2019; Lichtman, 2010; Malterud et al., 2015; van Rijnsoever, 2017). Patton (2002: 248) suggests orientation towards a minimal size, yet based on a “reasonable” coverage of the studied occurrence. Most researchers use the concept of “saturation”, such concept being borrowed from grounded theory, in order to assess whether the sample size is proper or not (Malterud et al., 2015; Sandelowski, 1995). According to this principle, a sample has a proper size if it is large enough in order to answer the research's questions, to achieve the study's purpose. Saturation is achieved when any further data collection would not result in the identification of a new theoretical category that would be useful for understanding and explaining the analysed occurrence. Yet, the meaning of “saturation” grew over the years. Moreover, there are no clear rules and methods that might convince the researcher that there is no reasonable doubt for achieving saturation, irrespective of its operationalization (theoretical or thematic saturation, data saturation, code saturation, meaning saturation, saturation as salience, etc.). Such inconveniences result in insecurity, which can be observed in the research reports by the lack of justification and transparency on how sample size sufficiency has been attained. Analysing a number of 845 qualitative studies, Kindsiko & Poltimäe (2019) finds that most of them do not justify how they assessed sample “sufficiency” and 10% of them indicate the saturation point as an assessment tool. Therefore, the minimal, sufficient size of a sample required to achieve the purpose of the research is hard to determine. Choice of proper sample size is still a field of concept debate and practical incertitude (Vasileiou et al., 2018).

Thus in summary it can be said that there are no clear methods and rules given for qualitative investigation in order to guide researches in establishing the sample's proper size. Size determination is simply a matter of consideration, as the researchers follow various guidelines in order to assess whether their own research sample is proper or not. This article aims at identifying the main scientific guidelines promoting research rigor for a qualitative research project.

## Purpose of the Study

In this paper the idea is to identify the most frequent extrinsic factors of a research project that impact upon the assessment of the qualitative research's sample size sufficiency. It is believed that the lack of consensus among methodologists and experts in the field in terms of qualitative research's sample size and of various limitations and barriers found across the study, determine both unexperienced

and experienced researchers to pay different importance to various specific parameters of their studies, the extrinsic ones being prevalent. Moreover, there is need to identify the role played by extrinsic factors in the sample size determination.

## Research Method

Basically, the researcher used qualitative method and analysed the content especially the Research Methodology. The researcher analysed 500 research protocols by analysing the research methodology with particular attention to the target population and the sample size.

## Research Findings

Determination of the sample size in qualitative research is affected by multiple factors, including the research topic, questions the research must answer to, research complexity, theoretical framework, epistemological tradition, research's type of approach, used methods, research population's structure and access thereto, resources and time at disposal for finalising the investigation, etc. Methodologist reunite them into two large categories, i.e. parameters relating to epistemological-methodological considerations and parameters related to practical research considerations. The first category brings forward the intrinsic determining factors of research projects, to which researchers should pay the greatest importance each time they assess sample size's sufficiency - appropriateness (Flick, 2012).

Given the nature of qualitative research and type of collected data, there are no "hard" rules for how many units should be included in the research sample (Lichtman, 2010) or universal numeric recommendations concerning the sample size (Kindsiko & Poltimäe, 2019; Vasileoiu et al., 2018). There are few formal statistical orientations to govern the estimation of a sample size (Sim et al., 2018, Marshall et al., 2013). As noted by Sandelowski (1995), assessment of the sample size's appropriateness becomes a "matter of judgement", depending on the milestones retained in the attention field by the researcher. Over the last decades, certain researchers analysed qualitative studies published in various magazines, from different countries and various fields (social sciences, education, healthcare, assessment of social welfare programs, management and organizations) and to collect opinions of the researchers who are performing qualitative researches, in order to identify the factors affecting the determination of a proper sample size (Flick, 2012; Baker & Edwards, 2012; Sim et al., Marshall et al., 2013; Kindsiko & Poltimäe, 2019). Their findings point to a greater importance of practical considerations and other sample size determining factors, extrinsic to the research project, rather than of methodological-epistemological considerations. The most frequently mentioned extrinsic factors impacting upon the sample size were the following four parameters: a) recommendations and perception of financing bodies' expectations; b) recommendations and perception of study assessors' expectations; and c) accessibility to research's population. We shall hereinafter detail the influence of such parameters on the qualitative research's sample size. Recommendations and perception of financing bodies' expectations Financial resources represent a major milestone for the researcher. Qualitative research projects are expensive, requesting material and financial resources, time and specialised human capital. Lack of or poor financial resources is a restraint with a massive impact on the sample size, forcing the researcher to refrain from including new cases in the sample, even if they were important for achieving the research's purpose, thus governing the projection and development of the research process. Methodologist and experts in this field say that researchers incline to include fewer units in samples when they lack financing. For instance, a survey made by Kindsiko & Poltimäe (2019) on 855 organisational qualitative researches published in top-ranked US and UK publications over an 11-year period (2007-2017), revealed a researchers' trend to reduce the sample size whenever they lack external financing (less than 60% of the studies are reaching 30 or more units per sample, with an average of 42 units). Financial limitations have major implications on the quality of research and reliability of its outputs, as the researcher is not exploring sufficient cases any longer so that to get to provide an explanation of the investigated occurrence, according to the proposed purpose. Most large-scale studies are dependant on external financing.

Most funding bodies impose upon the researchers to estimate and provide the number of units included in a sample (Guest et al., 2006; Baker și Edwards, 2012; Sim et al., 2018; Kindsiko & Poltimäe, 2019). The express requirements of the funding bodies and/or the perception of such requirements have an impact on the sample size. It is probably noticeable that whenever the research is funded, the sample size is larger. For instance, Adler & Adler (2012) identifies the researchers' trend to determine larger samples (100 and more respondents, at an average of 50) when they have external funding, as compared to the small sizes highlighted in non-funded researches (few studies reach 30 or more respondents, most samples include 6-12 units). The same trend has been observed by Kindsiko & Poltimäe (2019), at an average sample size of approx. 50. Provision of a certain sample size in funding protocols may coerce the researcher to explore as many units as they declared, even if they were not required, which has deep scientific implications – lack of understanding of the qualitative research's iterative approach, as the number of units included in a sample couldn't be known prior to

go on the field (Adler & Adler, 2012), and also ethical implications (waste of financial resources, material resources, time), the researchers trending to pay more attention to proving the sample's "goodness".

The findings of the research are recorded into three parts: the first part deals with the "Traditional non terra firma ways of calculating sample size for qualitative studies" while the second part deals with the "pre-considerations before calculating sample size in qualitative studies". The third and final part deals with the "Traditional terra firma ways of calculating Sample size for qualitative studies".

### **Traditional non terra firma ways of calculating Sample size for qualitative studies**

As mentioned already in the statement of the problem, the author of this article has been a lecturer at the University of Zambia since 2011 with many years of lecturing Qualitative Research Methods. Apart from that he has been an Assistant Dean Research in the School of Humanities and Social Sciences (HSS) and above all he is the Vice Chairperson of the Research Ethics Committee for the School of Humanities and Social Sciences which comprises of the School of Education, Law School and of course HSS. Experience shows that when it comes to calculating the magical number of the sample size, everyone wants to know how it has been worked out. For a lot of people, they arrived at the sample size almost like divine intervention or magic or personal volition. Not scientifically very convincing and it attracts some rebuttal from those who are in the quantitative sector. Unlike quantitative research projects, there are few formal statistical guidelines governing the design and execution of a qualitative research study. Best practices regarding randomness, confidence intervals, margins of error, and estimations for sample size needed are not standardized for qualitative research. Ultimately, these decisions are arrived at either by default or are simply chosen more based on intuition and past experience and not based on any known formula (How to Estimate the Sample Size You'll Need for Qualitative Research (cfrinc.net), viewed on 30/09/2023). This is further amplified by Daniela Rusu Mocănașu (2020) who had carried out a similar study. Mocănașu analysed about 845 qualitative studies, Kindsiko & Poltimäe (2019) and found out that most of them did not justify how they worked out the sample sample sizes (Daniela Rusu Mocănașu, <https://doi.org/10.26520/mcdisare.2020.4.181-187>). Therefore, at the point of working out the sample size, qualitative research appears to be not air tight and renders the research to lose some scientific rigor.

**The use of Imagination or Intuition:** In qualitative research study, the interest is to answer the question "why"? This question may not be answered by a lot of participants. It might just be answered by very few people. Therefore, quality appears to be more superior than quantity. That is why for a lot of people, they arrive at the sample size without taking into consideration the quantity of the participants, but instead the quality. Are these participants bringing more value? But in looking for this quality, some scholars do not mind about how they arrive at the sample size as long as they have participants who matter most. So they do not care about how they work out the sample size and hence they arrive at the sample size almost like divine intervention or magic or personal volition. As mentioned already, scientifically this is not very convincing and it attracts some rebuttal from those who are in the quantitative sector. Ultimately, these decisions are arrived at either by default or are simply chosen more based on intuition and past experience and not based on any known formula. This makes qualitative to lose its solidity and not on *terra firma*.

**Saturation Point of 30:** Another system they use in qualitative research is Reaching the Point of Saturation or Data Saturation as some may call it. What is this Point of Saturation? Saturation in qualitative research means that when interviewing a distinct segment of participants, you are able to explore all of the common themes the sample set has in common. In other words, after doing, let's say, 15 interviews about a specific topic, you start to hear all the participants say similar things. Since you have a fairly homogenous sample, these themes will start to come out after 10-20 interviews, if you've done your recruiting well (and sometimes as soon as 6 interviews). Once you hear the same themes, with no new information, this is data saturation (Sakshi Shetty 2018). You'll start to hit saturation, and you will get diminishing returns with more interviews. In this manner, qualitative research can have smaller sample sizes than quantitative, since it's thematic, versus statistical.

So typically, sample sizes will range from 6-20, per segment. (So if you have 5 segments, 6 is your multiplier for the total number you'll need, so you would have a total sample size of 30.)

But how did that become the most prevalently used number and how reliable is that as a default? As you evaluate your needs, understanding how and why a sample size of 30 is respected as an optimal number in qualitative research can provide increased confidence as new projects are structured. One method often used to estimate the needed number of qualitative interviews, online bulletin boards, or focus groups is to determine a feasible number given the limitations of the project (e.g., budget, timing, audience availability, etc.) and the intended scope.

In the context of academic research, Professors Patricia A. Alder and Peter Alder note how these limitations manifest themselves differently based on the academic level. For instance, they advise undergraduate students not to bite off more than they can chew, relegating themselves to around a dozen interviews. More generally, they say collectively that their best estimate "is to advise in the broad range of between a dozen and 60, with 30 being the mean."

Outside of academia, time limitations and budgets can govern this number. Considering the labour intensive work of conducting over 100 interviews requires a protracted timeline and significant budget. In these cases, examining the needs of variance of opinion is the best starting point.

In full consideration of project limitations, Peter DePaulo offers an alternative viewpoint regarding the determination of qualitative sample size. His predominant theory is that, within a subject with a limited amount of potential viewpoints, one can hear about 30 interviews before the “saturation point” of discovery is reached.

“Our qualitative sample must be big enough to assure that we are likely to hear most or all of the perceptions that might be important,” DePaulo states. “Within a target market, different customers may have diverse perceptions. Therefore, the smaller the sample size, the narrower the range of perceptions we may hear (How to Estimate the Sample Size You'll Need for Qualitative Research (cfrinc.net), viewed on 30/09/2023).”

According to InterQ intern, Sakshi Shetty (2018) a sample size should be large enough to sufficiently describe the phenomenon of interest, and address the research question at hand. But at the same time, a large sample size risks having repetitive data. The goal of qualitative research should thus be the attainment of saturation. Saturation occurs when adding more participants to the study does not result in obtaining additional perspectives or information. One can say there is a point of diminishing return with larger samples, as it leads to more data but doesn't necessarily lead to more information. As qualitative research works to obtain diverse opinions from a sample size on a client's product/service/project, saturated data does not serve to do anything. One respondent's opinion is enough to generate a code, part of the analysis framework. The goal of a qualitative study should be to have a large enough sample size to uncover a variety of opinions, but to limit the sample size at the point of saturation.

Saturation may only be scientific if the researcher is using Convenience or Snowball Sampling Methods. Convenience sampling implies that the respondents are simply those “who are easily available or convenient to interview”: fellow employees, people intercepted on the street, facebook fans of a brand, members of mailing lists, and online panellists. For example, if a researcher goes to a remote area during the rainy season and the people he wanted to interview have gone to cultivate. So he may end up interviewing other people because they are the only ones available. In that situation, if the researcher feels the number of people he has interviewed is enough, he can stop interviewing because he has gotten enough, hence he has reached the saturation point. This also applies to Snowball Sampling. In snowball sampling, the researcher asks a respondent to recommend other respondents who might subsequently be invited to take the survey. This is useful for very hard-to-reach audiences. In such a situation, the researcher may find it hard to know what the population looks like. Hence, depending on the situation, the researcher may just end up interviewing very few people and declare that to be enough, hence reaching the saturation point. These are the scientifically acceptable cases where saturation is acceptable to be scientific and provide academic research rigor.

**Financial, Energy and Time Draining:** According to Rachel Davies (2020), in writing about the Factors to determine your sample size for qualitative research, one of the points she raises is about the cost. According to Davies, in qualitative research, there is an age-old assumption that qualitative research can be expensive because the researcher may have to spend greater lengths of time analysing the data. Therefore, the greater the sample size, the more time it takes to understand and interpret the research and hence the more costs. The implication is that a quick, small study would be cheaper. It would require fewer working hours and would provide a smaller amount of analysis.

But should a researcher be guided by the financial, energy and time factors in working out a sample size? Such things should be looked into when working out the title. Why would anybody work out a title that is in terms of finances beyond once budget? Why would anybody embark on a research that was not affordable considering the energy levels of the researcher? Why would anybody embark on a research that was going to take too much time? To determine a sample size because of the fear for the financial, energy and time factors would be highly unscientific and would make the research not to be solid.

**Start large and reduce:** In determining the sample size in qualitative research, some scholars like Rachel Davies (2020) also advance the idea of starting a sample size with a large one and then reduce it. This approach enables a researcher to handpick a population of individuals that match one's criteria or target audience - aim to lower the initial sample size down to around 30-40 participants.

While this method is acceptable, yet it may only be applied when the sampling technique is Convenience method. How does one reduce it to acceptable standards? How would one determine that this is acceptable now? Which scientific method is one going to apply? This appears to depend on one's personal volition and therefore scientifically doubtful.

**Long-Term Campaigns:** This boils down to the time factor. Rachel Davies (2020) is for the idea that if the qualitative research is meant for a long term, then it qualifies to have a large sample size. This is in order to allow for enough time to do the interviews and engage the respondents with all the energy required.

While this could be true, yet a researcher should be prepared for labour intensive depending on the topic. This simply appears to be fear to engage in intensive work. Unfortunately, there are no two ways about it. Academic work is not for the faint hearted. It is not for *laissez faire*. It calls for hard work.

**Research Questions:** According to Daniela Rusu Mocănașu (2020), which are the main extrinsic milestones of a qualitative research project used as guidelines by researchers when they assess a sample size as sufficient? Is there paid greater importance to extrinsic factors of the research project when determining the proper sample size, as compared to the factors relating to methodological-epistemological considerations, which are specific to the investigation approach?

All the research questions are very important. A researcher is advised not to jump any stage, but to allow for a proper flow of questions in order to allow at the truth. A researcher needs to be logical and follow the order to arrive at the required answers. So there are no short cuts. Hence research questions alone are not enough to determine the sample size.

### **Pre-considerations before calculating sample size in qualitative studies**

This article has looked at the traditional ways of determining the sample size. It initially started by looking at the traditional ways which are not on solid ground. Now it wishes to move on and look at the traditional ways which stand on solid ground. But prior to looking at these traditional ways which stand on *terra firma*, this research wishes to consider some of the pre-considerations which are supposed to be put into place before the sample size is determined. According to Sakshi Shetty (2018), when doing qualitative research, several factors must be considered before blindly accepting an arbitrary number. Here are some important points that should be kept in mind when thinking about the sample size:

**Quality over Quantity:** According to Sakshi Shetty (2018), the first objective when conducting qualitative research should be to ensure the right people are recruited for the study. The right respondents for the study are those who meet each and every criteria line-item identified from quantitative research studies, and also the criteria that the clients have identified through their own research. Thus, a high quality panel includes much more than just members who are pulled from a general population that falls within broad parameters. Only those participants who match the audience specifications and background relevance expressed by the client should be recruited.

**Choosing an appropriate study design:** The type of qualitative study is another important factor to consider when choosing sample size. There are various methods that can be used to gather insightful data, but not all methods may be applicable to your study and its aim. In-depth interviews, focus groups, and ethnographic research are the most common methods used in qualitative research, each method being unique in the information it can provide and the setting it can be used in. Moreover, the types of questions being studied have an equally important role to play in deciding sample size. Thus before choosing a sample size, make sure all the parameters, aims, and controls are clearly outlined (Shetty 2018).

**Finding the Right Fit:** Regardless of the quantity, insights professionals also consider quality benchmarks to achieve reliable and representative qualitative results once the number and the required strata are determined. Research objectives can be included in screener questionnaires for greater clarification and precision. A proper recruitment partner can confidently and transparently confirm participant qualifications to ensure quality at any sample size. In the context of discovery work, qualitative researchers may not see sample size as a significant requirement for standardization. This work is typically more iterative and often follows new findings as they emerge. While the amount of empirical data may have a required critical size, the size of the sample may be irrelevant (Shetty 2018).

**Depends on what one aims to discover:** A common question that is asked when working with new and existing clients is sample size - it always crops up along with further enquiries around minimum sample size, what constitutes a large sample and should one be aiming to get more people for quantitative research purposes? The proper answer is that there is no one size fits all. The health of one's qualitative research, as always, will depend on what one is aiming to discover. There are many elements that affect research, but one special point is to consider what one aims to find out. That is one special determining factor in the sample size. In Psychology, for example, one may just deal with less than five participants (Davies 2020).

**Segmentation of participants:** In qualitative research, because the goal is to understand themes and patterns of a particular subset (versus a broad population), the first step is *segmentation*. You may also know of this as "persona" development, but regardless of what

you call it, the idea is to first bucket your various buyer/customer types into like-categories. For example, if you're selling sales software, your target isn't every single company who sells products. It's likely much more specific: like mid-market sized VP-level sales executives who have a technology product and use a cloud-based CRM. If that's your main buyer, that's your segment who you would focus on in qualitative research (Shetty 2018).

Generally, most companies have multiple targets, so the trick is to think about all the various buyers/consumers and identify which underlying traits they have in common, as well as which traits differentiate them from other targets. Typically, this is where quantitative data comes into play: either through internal data analysis or surveys. Whatever your process, this is step 1 to figure out the segments you will be bucketing participants into so you can move into the qualitative phase, where you'll ask in-depth questions, via interviews, to each segment category. At this stage, it's time to bring in your recruiting company to find your participants.

**Figure out the appropriate study design:** After you've tackled your segmentation exercise and know how to divide up your participants, you'll need to think through the qualitative methodology that is most appropriate for answering your research questions. At InterQ Research, the studies are designed through the lens of *contextual research*. This means that you want to set up your studies to be as close to real life as possible. Is your product sale done through a group discussion or individual decision? Often, when teams decide on software or technology stacks, they'll want to test it and talk amongst themselves. If this is the case, you would need to interview the team or a team of like-minded professionals to see how they come to a decision. In this case, focus groups would be a great methodology.

Conversely, if your product is thought through on an individual-basis, like, perhaps, a person navigating a website when purchasing a plane ticket, then you'd want to interview the individual, alone. In this case, you'd want to choose a hybrid approach, of a user experience/journey mapping exercise, along with an in-depth interview (Shetty 2018).

### Traditional *terra firma* ways of calculating Sample size for qualitative studies

**Logical Purposive Reasoning:** In calculating the sample size in qualitative research studies, if the researcher is using a purposeful sample size, then the calculation of the sample size may just be in accordance with the required participants. According to Jeffrey Henning (2016), Purposive Sampling is a situation whereby the interview or study designer chooses sampled units who, by their judgement, will meet the specific purpose of the survey. For instance, if a researcher wants to do a research at the University of Zambia and find out why the students at UNZA go to stone the cars driving along great east road when they riot. If in working out the sample size, the researcher wants to do purposive sampling, then the researcher may just interview the union leadership of the students, the union leadership of the lecturers and the university management. This would be less than 50. Thus, it can be observed that in the judgement of the researcher, these participants would be able to give the required information.

**Application of a Formula:** What is the formula for sample size? There are many formulas used for calculating sample size. Indeed, whether it is Qualitative or Quantitative research method, the starting point to choose the sample size involves numbers and hence mathematical. Therefore, it requires a formula. Below are some of the formulas used to come up with a sample size: The formula is as follows:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Another formula is that of Taro Yamane:

$$n = \frac{N}{1 + N (e)^2}$$

Whereas: N = Target Population; n = Total Sample Size; e = Desired margin error

The desired margin error is given to be between (0.05 – 0.9).

Below is an example: Assuming that the target population/total population for the research is 422. The sample size would be calculated as follows:

$$n = \frac{N}{1 + N (e)^2}$$
$$n = \frac{422}{1 + 422 (0.05)^2}$$
$$n = \frac{422}{1 + 422 (0.05 \times 0.05)}$$
$$n = \frac{422}{1 + 422 \times 0.0025}$$
$$n = \frac{422}{1 + 1.055}$$
$$n = \frac{422}{2.055}$$

**n = 205** In this research study, the sample size is 205.

What is the formula for calculating sample size? (calculating sample size for qualitative research - Google Search).

**One Quarter of the target population:** In some research circles, people say One Quarter of the target population is an acceptable sample size even without calculating. If, for example, one has a study population of 1000 participants, according to this kind of reasoning whereby a quarter is deemed to be fairly representative, it would imply that 250 would be one quarter and hence would be representative enough. This sounds to be scientific and acceptable.

**Ratio:** The ratio is defined as the comparison of two quantities of the same units that indicates how much of one quantity is present in the other quantity. Ratio is used to indicate how big or small a quantity is when compared to another. In a ratio, two quantities are compared using division. The ratio formula could be used while comparing the relationship between two numbers or quantities. In order to calculate the ratio of two quantities, a researcher can use the following steps. Imagine that there are 1000 participants. One participant can represent 10 participants. Therefore, the ratio is 10:1000. This can be converted into a very small fraction by dividing 100 into 1000 and it comes to 1:100. In this calculation, it means that the sample size is 100. This could be used to come up with a sample size as long as the number is even.

**Modern technology and Artificial Intelligence:** This is an era where Artificial Intelligence as a result of technology is taking a centre stage and working out miracles to simplify calculations including the calculation of the sample size. According to [Aruna Pattam](#) (2021), artificial intelligence is the science of making machines that can think like humans. It can do things that are considered "smart." AI technology can process large amounts of data in ways, unlike humans. The goal for AI is to be able to do things such as recognize patterns, make decisions, and judge like humans. AI technology would therefore be able to help in calculating the sample size whether qualitative or quantitative.

### Recommendations and perception of study assessors' expectations

The requirements expressly provided by the qualitative study's assessors (members of ethical boards, boards of reviewers, boards for undergraduate / postgraduate / doctoral thesis, editor boards of magazines, etc.) on the minimal sample size and/or the perception of

assessors' expectation, generated by the assessment of study's quality and its selection for being accepted as valid by the academic community and/or for publishing purposes, have an impact on the sample size. Assessors' requirements are pressing or are perceived as such, which results in larger sample sizes. Researchers tend to increase the sample size so as to convince any eager criticist on their research's validity and quality. Most assessors use saturation as the tool for judging whether a sample is "good", sufficient or not.

The perception of the values embraced by the members of those boards, the epistemological tradition promoted by the academic community within the study's area, institutional regulation and purposes of such institutions lead to the creation of certain representations with respect to the standards used by assessors to assess qualitative research, therefore to the study's sample size, which are often contrasting. For instance, following the analysis of overviews of interview-based qualitative researches included in a PhD papers in Great Britain and Ireland, Mason (2010 quoted by Brayman, 2012, p. 18) finds a variation of the sample size from 1 to 95 (averages being of 31 in the first case and 28 in the second). The research region – one of the cultural factors, plays a significant role in determining the qualitative research's sample size. Through values to which members of the magazine's board of editors adhere, regulations of institutions (Marshall et al., 2013, p. 19) and epistemological tradition, standards are being drafted for the assessment of qualitative researches for publishing purposes, including the sample size. Marshall et al., (2013) have analysed 83 interview-based qualitative studies, published in top-ranked IT magazines from USA, Canada, Asia and Europe, so as to identify to what extent the cultural factor (publishing magazine, author count, region where the journal publishing the study is located in) affected the sample size. They identified a sample size pattern, correlating to the journal where the study is published in (pp. 11-16). Authors publishing in US and Canada journals tend to perform studies on larger samples (50% of the studies include 30 or less people in the sample) as compared to authors whose papers are published by journals in Europe and Asia, who tend to use small size samples (77% studies published in Europe and 71% included 30 or less people in the sample). The same pattern was found by Kindsiko, & Poltimäe (2019). Multiple authors find that greater importance is paid to assessors' requirements, cultural factors (the publishing journal, study's region) as compared to methodologists' recommendations or previously published relevant papers (guidelines relating to epistemological-methodological considerations). Vasileiou et al., (2018) found, after having examined 214 articles of healthcare qualitative researches dating from 2003-2017, that pragmatic arguments are the secondly ranked criterion for supporting sample size.

## Conclusion

In order to obtain a positive assessment from reviewers and/or for their qualitative studies to be accepted, researchers pay attention, in the first place, to certain extrinsic parameters of research project, factors that are not related to the nature of qualitative research, such as scope of study, investigation questions or other epistemological-methodological considerations.

The most frequently pursued milestones by researchers for assessing their sample size as "sufficient", proper for achieving the study's purpose, as it results from the mentions included within the studied researches, are: recommendations and perception of financing bodies' expectations; recommendations and perception of study assessors' expectations (members of undergraduate / postgraduate / PhD boards; members of ethical boards; members of the board of editors from the publications such researches are published in) and accessibility to research's population.

Very few researchers justify how they assessed the sample size sufficiency, thus leading to a reliability downturn with respect to the outcome of the performed research. Moreover, ethical implications may arise, i.e. waste of research funding and of participants' time. It has been found out that though researchers use methods such as **the use of Imagination or Intuition**; saturation point; Financial, Energy and Time Draining; **Start large and reduce**; **Long-Term Campaigns and Research Questions** in working out air tight sample sizes in research, yet these methods do not help to attain the scientific academic rigor required in research. Instead the methods respected in working out sample sizes with air tight scientific and academic rigor are Logical Purposive Reasoning; Application of a Formula; One Quarter of the target population; Ratio and **Modern technology and Artificial Intelligence**.

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