The teaching of Statistics in basic education in Brazil is in general the responsibility of teachers with a Mathematics degree, which implies that Statistics education, at this level of teaching, is not independent of Mathematics education. Mathematics education, more than just as a field of research and teaching, should be considered as a discipline for research and practice, and it is necessary to think about the role of Statistics education in this context. In fact, since Statistics is only given a limited space in the curriculum of Mathematics majors, ideas such as "inference" have been taught to teachers without considering the relationships and differences between both areas. Moreover, we think we should discuss this theme not only within the Mathematics and Statistics subjects. Graduating in Mathematics enables the student to teach and, to some extent, become a mathematical educator who can enhance knowledge in Education, and investigate the "human" areas where qualitative research is getting more importance. In this respect, it is also necessary to discuss the process of production of new information in the context of qualitative and educational research.

The process of obtaining new mathematical information is deductive. A hypothesis (p) is formulated about a general system and the conclusion (q) is verified for a more restricted system. Mathematical inference is done via a demonstration that establishes the generality of a proposition (property and/or theorem). The demonstration of a proposition is an argumentative sequence that logically follows from other accepted propositions. Propositions are of the type “if p then q”; the hypothesis and thesis are mathematical affirmations. In such propositions the hypothesis is called “antecedent” or “premise” (p); when it is true, the veracity of the “consequential” affirmation, called “thesis” or “conclusion” (q), is followed. In Classical Logic the implications: “if p then q” and “if ~q then ~p” are equivalent, since these are the two ways of conditional reasoning, called modus ponens – affirmative argument – and modus tollens – negative argument.

In Statistics we obtain new information through inductive reasoning from a hypothesis, which is verified in a more restricted system (a sample); we try to get conclusions about a more general system (a population). Given a possible property and a population, if this property is not verified in the sample, the modus tollens reasoning gives us the legitimacy to conclude that this property is not verified in the population either. This property is called the “null hypothesis” that the researcher tried to reject. Neyman added the “alternative hypothesis to the Statistics theory,” in such a way that when the null hypothesis is rejected we have some evidence for the alternative hypothesis. A probability model serves to quantify this evidence, so that Statistical Inference intends to affirm that the conclusion is probably true, given that the premises are true. These two kinds of inference are not enough for qualitative research, especially in educational research.

We therefore suggest a new construction that we call Qualitative Inference. Given that researchers use deductive reasoning as guidelines in Mathematics and inductive reasoning in Statistics, in qualitative research the options depend on the paths to be followed and the procedures to be developed. Research about the method takes implicit indications of Gnostic character and the different conceptions of the reality determine distinctive methods.

In this way, researchers should be aware of the diversity of scientific paradigms, and recognize the presence of its respective scientific and self-assessment criteria. They also should keep aware of the debates about the evolution of research trends to better define the quality of Research Processes, including “qualitative inference.” We think a consideration of qualitative inference should be included in the context of teachers’ training, since a Mathematics and Statistics teacher should become a producer of new knowledge rather than a mere reproducer of knowledge. For this reason he/she should know to differentiate and articulate the areas where he/she works, and understand how inferences in these areas are made.