

Competencies of the area of statistics in legal research

Competencias del área de estadística en la investigación jurídica

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ABSTRACT

The activity carried out by legal institutions in societies as an expression of social and human realities, demands the understanding of these for the construction of a fair and equitable legal order, which contributes to generate progress, development and individual and social welfare. Achieving this understanding and promoting the generation of knowledge requires that the training offered by universities to future legal professionals emphasizes training for research as an instrument for generating knowledge, providing them with solid competencies and contributing to their education as ethical citizens; cultivating critical and independent thinking and the capacity for lifelong learning. Based on these premises, the paper proposes a reflection on research in the legal field and the unavoidable training of law students in competencies related to the application of statistical techniques and tools to social facts, to measure them, deduce laws that govern them and make predictions. As a condition to carry out legal research, creating rigorous knowledge and validity to analyze and explain material and human facts that determine the social structure.

Keywords: research training; law studies; legal research and statistical competence.

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RESUMEN

La actividad que realizan las instituciones jurídicas en las sociedades como expresión de realidades sociales y humanas, demanda la comprensión de éstas para la construcción del orden jurídico justo y equitativo, que contribuya a generar progreso, desarrollo y bienestar individual y social. Alcanzar esta comprensión e impulsar generación de conocimiento, demanda que la formación que ofrecen las universidades al futuro profesional del derecho ponga su acento en formar para la investigación como instrumento generador de conocimiento, proveerlos de competencias sólidas y contribuir a su educación como ciudadanos éticos; cultivarles el pensamiento crítico e independiente y la capacidad de aprender a lo largo de toda la vida. A partir de estas premisas, el trabajo propone una reflexión sobre la investigación en el campo jurídico y la ineludible formación de los estudiantes de derecho en competencias relacionadas con la aplicación de técnicas e instrumentos estadísticos a los hechos sociales, para medirlos, deducir leyes que los rigen y hacer predicciones. Como condición para llevar a cabo investigación jurídica, creadora de conocimiento riguroso y de validez para analizar y explicar hechos materiales y humanos que determinan la estructura social.

Palabras clave: Formación investigativa; estudios de derecho; investigación jurídica y la competencia en estadística.

INTRODUCTION

Nowadays, there is no university that does not integrate research as a fundamental task in its paradigm. So much so that this activity is mandatory both at the undergraduate and graduate level, in the student and faculty environment in all disciplines. Of course, the law career is no exception, so, as in the rest of the disciplines, the creation of research units has proliferated. This has induced the academic directions of all the houses of study that offer third and fourth level teaching, to worry about developing in the teaching staff, the necessary research skills that allow the university to remain at the competitive level demanded by the intellectual environment, nationally and internationally, through scientific publications of various kinds. At the same time, student training with a marked propensity towards research has become part of the study programs.

Indeed, in the context of higher education, the necessary interaction and integration between the substantive functions of teaching, research and liaison has become inexorable, such that the fundamental parameter associated with the qualification in international rankings of any university is the research function closely related to the scientific productivity of its professors.

Notwithstanding this remarkable importance given to research, it is fair to recognize the limitations that a large number of Latin American universities suffer in this field in order to achieve the minimum standards required for academic recognition. This is most probably due, among other reasons, to the fact that teachers do not have the basic research competencies to develop research processes and, at the same time, favor research training in their students. There are several areas that should be emphasized to contribute to strengthen this training, among them, training in epistemologies of

knowledge, application of research approaches and methodologies and the use of statistical analysis methods, preparation that should be based on the principle of 'learning to research by doing research', so that it contributes, from practice, to strengthen the acquisition and development of skills.

Meanwhile, in the field of law, we note from experience that, in the legal community, there is a growing need for statistical education. We can refer in this regard, as a pioneer, to Dr. Michael O. Finkelstein, who has more than 30 years of experience in teaching statistics to lawyers at the universities of Columbia, Harvard, Yale and Pennsylvania, as well as being the author of numerous articles and the works "Quantitative Methods in Law" 1978 and Statistics for Lawyers 1990, (Torres, 2013, p. 43).

Training professionals with the ability to use knowledge and adequate instruments to solve problems and transform reality is a necessity today. Therefore, we ask ourselves: what is research in the legal sciences? what do we mean when we talk about research competences? and what are the research competences specifically related to the effective mastery of statistics, as a methodological component of research in the legal sciences?

In relation to the first question about what is research in the legal sciences, related to the first objective, it is necessary to explain what is not research, in order to favor the understanding of how we can characterize scientific research in the legal sciences.

In the university context, it should be noted that it is not possible to understand research as the mere search for data or knowledge on a specific topic, or to inquire about scientific theories and methods that others have already presented or demonstrated. Although information on these theoretical and conceptual categories is important in training, because they constitute the theoretical foundation of empirical research, and it is mandatory that it be addressed by students, for their assimilation in the learning process of the various curricular subjects, this simply cannot be considered as research. This is an informative work, which aims to increase the knowledge of the person who performs it. It is part of the learning that undergraduate students must achieve, but it can never be conceived as scientific research.

Scientific research, on the other hand, is that which aims to carry out a set of methodological and empirical processes, carried out systematically for the study of the phenomena of reality and the search for additional or complementary knowledge to the existing one, or "is the perennial transit from a given knowledge to a superior knowledge, through the dialectically renewed apprehension of an additional knowledge" (Bascuñán, 1961, p. 20).

It is important to emphasize that, in this permanent search for knowledge, throughout the history of science, there have been several currents of thought (empiricism, dialectical materialism, positivism, phenomenology, structuralism) and various interpretative frameworks, such as realism and constructivism, which have been concerned with explaining how to access knowledge. However, due to the different premises underlying them, these approaches have polarized into two research

approaches: the positivist, quantitative approach and the phenomenological or qualitative approach.

Both approaches employ methodical, systematic and empirical processes in their purpose of contributing to the generation of knowledge. Hence, they argue that both approaches use five similar and interrelated strategies: 1. 2. They establish assumptions or ideas as a consequence of the observation and evaluation carried out. Demonstrate the degree to which the assumptions or ideas have merit. 4. Revise such assumptions or ideas on the basis of the evidence or analysis. 5. Propose new observations and evaluations to clarify, modify, and substantiate the assumptions and ideas, or even to generate new ones.

Thus, it is possible to observe that although these approaches are totally different epistemologically, they share similar general strategies related to the logic of the scientific research process.

Now, research in the legal sciences consists of the process of rigorous study, aimed at discovering the most appropriate solutions to the problems posed by the social life of our time, increasingly dynamic and changing, and to find the way to adapt the legal system to social transformations and changes, taking into account the social reality in which it is immersed, in accordance with the current approach of linking legal science to the other disciplines of a social nature.

On the question, what do we mean when we talk about research competencies? In a general sense, we can express that:

(...) research competencies refer to "complex systems of thought and action, which through the combination of scientific knowledge, skills, attitudes and values (Pérez, 2008, p. 17) are mobilized as: knowledge, know-how and know-how to do, associated with research capabilities and skills, which integrated to methodological tools, set in motion, in a defined context, the ability to identify problems, use research skills, and use them in a specific context. 17) are mobilized as: knowledge, know-how and know-how, associated with research skills and abilities, which integrated to methodological tools, implement, in a defined context, the ability to identify problems, to use knowledge, to build tools and apply them, to explain scientific phenomena, to draw conclusions based on scientific evidence and to know how to transfer, transcending the immediate context, to act and apply to new situations and to transform them (Espinoza et al., 2016, p. 23). Authors define them as "an integrated system of knowledge, procedural skills, attitudes and values necessary to enable the ideal performance in carrying out research tasks" (Estrada, 2014, p 32).

Another recent approach conceptualizes competencies in terms of the research process. Hence, they propose a model of social-scientific research competency, which includes three components: 1) knowledge of the research process; 2) problematization; 3) knowledge of the method and processes of analysis and verification; which are developed in three important steps: a) identification of the research problem and research planning; b) theorization; and c) analysis and interpretation of data. That is, the competences of

problematization, theorization and testing to be applied in the solution of problems of the environment. (Segura, 2012, p. 24).

Therefore, competence is the ability to integrate what one does with what one knows and is. To be competent is to know how to do and to know how to act from what one is as a human being in a given context. Hence, one only learns to do research by participating in research experiences. Making research a task rich in valuable cognitive and intellectual experiences and meaningful practices for the formation of the student that induces him to get involved in matters related to science as a reflective citizen. Pata Duéñez & Aguilar, (2016) a more precise way we could say that it is the set of skills, knowledge, methodological skills, teaching skills and personal characteristics, which allow the teacher to address the research activity, with a clear focus on training the student to inquire into reality, build knowledge and apply it to transform it. The training in competences supposes then, to favor in the students the development and strengthening of their cognitive and metacognitive abilities and processes, of the use and regulation of their affective, motivational and attitudinal processes to question situations, explain them and with responsibility contribute to solve them.

In the same vein, we consider that it synthesizes the different approaches to the subject with the following definition:

The psychological configuration of the teacher's personality and the construct that designates his or her suitability to improve the students' educational process through the research activity in which the actions of scientific exploration of the educational reality, the projection of the research, the execution of the research, the analysis of the results of the research process, the communication of the results and the introduction and generalization of the results in the social practice are specified (Hernández & Ospina, 2005, p. 45).

The above leads us to consider a classification of research competencies into two types: general and specific. The general ones comprise the attitudinal and skills related to the knowledge and experience on the logical processes of research. The specific ones are those competences related to the identification and solution of specific problems of the disciplinary fields; with the theoretical precision to define concepts and the variables under study; the selection and design of instruments for the collection of information; the definition and application of statistical analysis methods for the processing and analysis of information; the adequate use of technology and decisions on the modalities of communication and dissemination of results.

In terms of specific competencies, "Collection, processing and analysis of information" is presented as a fundamental skill, since it is indispensable for teachers, in one way or another, to handle data in their research. This, of course, implies in an unavoidable way, the basic mastery of the statistical tool, coupled with other commonly used computer facilities such as Excel, SPSS, along with the battery of statistical methods provided by both softwares for capturing, classifying and obtaining all kinds of graphs and reports.

MATERIALS AND METHODS

As it is to be expected, as research management has become imperative in universities, the "Research Unit" (RU) has emerged in the different careers, organized as an academic space made up of professors and students with the purpose of developing research that can broaden scientific knowledge and contribute to universal, national and regional knowledge. In relation to the latter, generally, the UI's essence is to respond to the needs associated with current problems or to provide solutions to specific questions that arise from the dynamics of interrelation with the regional environment.

They are also oriented to fulfill a dual function in the sense that they are meeting places for research, but they are also a teaching environment for the training of researchers. That is to say, the UI develop the capacity to generate their own research personnel from the faculty and the student body, in order to amplify the knowledge-producing performance in their areas of interest.

In the operation of the PIUs, the contact with the community stands out in a relevant way, capable of responding to the demands of the latter in terms of knowledge on specific problems, with the consequent contribution to the optimization of the interaction with the Civil Society and its problems, thus contributing to improve the quality of Management in the Community.

Another crucial aspect in the conception of the UI is the development of logistical and administrative skills aimed at generating scientific promotion events such as Congresses, Seminars, Symposiums, Forums, Meetings or other meetings with an academic format, which can be promoted by the university itself or which are proposed by other Universities, or public or private organizations, for research or teaching purposes, which are adapted to the aims and purposes of the university.

In particular, at the Catholic University of Cuenca, the normative support of the units in question is clearly established as follows:

1. Articles 350 and 87 paragraphs 1, 2, 3, 3, 4 and 5 of the Constitution of the Republic of Ecuador.
2. Article 147 of the Organic Law of Higher Education.
3. Articles 2 paragraphs b, d, and i, 71, 73, 74, 75 and 76 of the Academic Regulations issued by the ESC.
4. Articles 3, 5 and 7 of the Organic Statutes of the Catholic University of Cuenca.
5. Research Regulations of the Catholic University of Cuenca, in all its extension.

In this course, we can generally say that research implies a sequence of programmed activities, carried out in a formal and systematic way in order to reach a novel knowledge, using a determined methodology. Accordingly, the researcher aspires to the original understanding of certain phenomena or to a different approach to an already known topic. Also, sometimes, academic research aims at influencing an area of reality in order to make a change in a given problem. This task must be coated with objectivity, trying, as far as possible, to discard in the conclusions, assumptions or ideas in which a strict discourse and a scientific method are present (Estigarribia, 2015, p. 56).

By way of example, a dogmatic research would deal with the humanistic essence of the "Principle of Opportunity". Similarly, an exegetical research could be undertaken through commentaries on the Penal Code. In the same way, a historical research would consider investigating the evolution of Jurisprudence regarding Criminal Cassation.

Finally, regardless of the type of research that is addressed, in law, we can characterize the research activity as a process of construction of increasingly complex knowledge... a process that can be thought of as a spiral that, as it progresses, becomes more complex, due to the processes and factors involved. Therefore, this process cannot be seen as a simple chronological sequence of linear moments. They are moments that happen and are articulated with each other.

Now, it is very common that legal research involves in most cases, the handling of quantitative variables from the collection of information in a specific field of interest, which has led to include in some law curricula, mathematics, since it is a fact that in professional practice and in fourth level studies, the application of this science is required in the interaction with specialists from other careers. It is also growing in the lawyer's activity, not only the knowledge, but also the basic mastery of the facilities provided by economics, statistics, and general accounting. In this order of ideas, it is indisputable that both mathematics and statistics develop the logical thinking of lawyers, allowing them to build solid argumentative structures that are difficult to demolish. In the specific case of statistics, it is essential to contemplate it in the investigations that involve the collection, processing and analysis of information, especially if we are facing random situations and facts, as it happens in the criminal, civil and commercial areas, among others.

In the described environment and given the necessary competence for every researcher in data management using statistical tools, it is important to refer that the term "statistics" has been part of the scientific lexicon for three centuries, to denote any presentation in figures that tends to strengthen the power of States. Initially dispersed in geography, politics, economics and demography, it has finally been able to be distinguished using mathematics and especially the calculation of probabilities as a basis, to be applied in practically all scientific disciplines, including the social sciences. Thus, at the present time, statistics must be treated in the opinion of

As the study of collectivities, understanding under this general term not only social collectivities, but groups of numerous facts of the same nature, whatever, on the other hand, these facts may be, as long as they can be counted and classified according to certain distinct modalities". (Rica et al., 2006, p. 44)

In general, it is the discipline of data management par excellence. It can be inferred then that, by its nature, it is essential for decision making, if we start from numerical information with the due calculation of risks, in the face of a future loaded with varying degrees of uncertainty.

The approach then, to an uncertain future through reasoning that brings us closer to different scenarios with the greatest precision, or that brings us closer to the truth of large collectives through the study of subsets of these, with the proper technique, directs us towards inductive or inferential statistics as a scientific method of investigation, since

as an argumentative way, starting from the particularities of a sample, we come to characterize a population, with a degree of probability that allows us to dissipate uncertainty and make more accurate decisions (Chou, 1972, p. 1-5).1-5).

In the understanding that the word statistics, in the singular, is used to designate the numerical results associated with the application of the methods and that the expression, statistics, is used to characterize the tables of figures where the corresponding results are appreciated, we can then say that statistics is a discipline integrated by a set of methods applied, not only to the economic and social sciences but also to different areas of knowledge in which we wish to observe regularities. In fact, our experience indicates that in university careers such as: education, economics, sociology, anthropology, administration, accounting, computer science, psychology, medicine, nursing, dentistry, agronomy, veterinary medicine and many others, "statistics" is a compulsory subject, not to mention specialties, masters and doctorates.

In the meantime, we emphasize that, depending on the magnitude of the human or physical group to be studied, we will decide whether to analyze the "population", the entire "universe" or a "sample" of it. In the case of the former, we designate it as a finite collectivity delimited in space and time; in the case of the latter, we refer to a subset of the population, to which the research will refer, either to reduce costs and time due to the prompt need for information, or because the entire universe is inaccessible Kleeberg & Ramos, (2009) say that it is a scientific achievement to reach with high precision the knowledge of populations through the statistical and mathematical management of samples, with calculable error levels. In the latter case, it is essential to apply sampling procedures that guarantee the most accurate possible induction or inference about the population, with the lowest possible degree of error. It is therefore of vital importance to clearly define the statistical unit to be observed and that it can be counted and classified according to its distinctive characteristics. (Rodriguez et al., 2015, p. 9). In relation to what has been explained, our experience leads us to determine that, when approaching this step in the project, we must unfailingly contemplate aspects such as:

1. Field tests.
2. Training of surveyors
3. Quality control
4. Processing tests.
5. Ease for respondents.
6. Accuracy of questions.
7. Mode is to expose the questions (open, closed, numerical, alternative, double alternative, suggestive, rude, soft, etc.).
8. Do not leave much initiative to respondents.
9. Clarity.
10. Religion.
11. Status quo.

12. Use of simple, non-aggressive, non-disturbing terms, without regionalisms and of common use, among others.
13. Confidentiality of responses
14. Guarantee of strict relation of the questions with the research objectives.
15. Strict relationship of the questions with the output tables and with the indicators to be obtained.

RESULTS

If we take as an example, the case of a constitutional reform of the criminal justice systems in the countries, where the pattern that previously revolved around the judge with prevalence of written mechanics, is moving towards an oral, public, transparent, open scheme with certain ingredients such as immediacy, in which the parties are always in direct contact with the judge, in a controlled environment, with audio and video, the use of statistics to face the complex planning problems inherent to a transition is obvious, since an erroneous estimation of the necessary resources can cause a collapse for the new paradigm. This is where knowledge that most lawyers do not have is required. In general, the state transformation projects are always covered with quantitative methods that generate mathematical models to make very concrete decisions. For the case in question, the following questions arise: how is the judicial system impacted in terms of the number of courts? How many judges should be trained? How should the physical space be increased? How should the Public Prosecutor's Office and the Public Defender's Office be transformed? How should the universities change their curricula? among many other issues specific to the Penal System (Rengifo, et al. 2019, p.584).

For a specific case, it was interesting to study which evidentiary instrument was used with predilection in a Venezuelan locality. The research sought to compare the main means of evidence used in the field of law: the testimony, the document and the expert opinion. For this purpose, the Register of Structures and the cartographic material elaborated on the occasion of the 2001 census in Venezuela were used, on which a representative sample of the dwellings that made up the town was designed; on these, and taking into account the age structure, the group between 18 and 65 years of age was selected to survey the individuals who, by simple random sampling, appeared to be selected. The study showed that testimony was the means of evidence par excellence. In addition, interesting results were obtained associated with measures of central tendency, such as the arithmetic mean, median, mode and the respective statistical graphs. It is worth noting here how the use of these results by lawyers in the region resulted in the assumption of a different approach to evidentiary activity.

Another study in which the use of descriptive statistics was crucial, in relation to "The sentences of the Venezuelan Criminal Cassation Chamber, on drugs, in the period January 2000 - August 2004". Here, using the appropriate statistical methods on a given population, the following results were obtained as the most important:

- 1) Presumably, the Criminal Cassation Chamber has a conception of what an Appeal in Cassation should be, almost totally unknown to the vast majority of lawyers who litigate as defense counsel.
- 2) Presumably, the lawyers of the Prosecutor's Office are duly aware of the category and the scheme of thought that reigns in the Criminal Cassation Chamber, regarding the filing of an Appeal in Cassation.
- 3) The probability of success of an appeal proposed by a defense attorney is almost nil.
- 4) The probability of success of an Appeal proposed by a Prosecutor is quite high.
- 5) The likelihood of dismissal of an Appeal of Cassation proposed by a Prosecutor as manifestly unfounded is nil.
- 6) The probability of dismissal as manifestly unfounded, of an Appeal proposed by a Defense Lawyer is so high that it almost becomes a certain event. (Luna Salas, 2020, p. 24).

Following this line of study, we bring to mention the work done by Rengifo et al. (2019, p. 602), entitled, "Procedural treatment and use of preventive detention in a sample of hearings of control of guarantees in Bogota and Cali". This author, in rigorous application of the most refined methods of inductive or inferential statistics, reaches, among others, the following conclusions:

- 1) Most of the cases involve property or drug-related crimes.
- 2) In the judicial proceedings, there are contextual characteristics and "extralegal" factors that go beyond the formal criteria typically considered in the legal and academic literature.
- 3) Significant barriers and penalties were found that implicitly or explicitly target ethnic or racial minorities.
- 4) At the level of preliminary hearings, criminal action is given higher priority in the most complex criminal cases through preventive detention.
- 5) Judges show more consideration towards a defense that is appreciated as more professional or more knowledgeable in terms of the new adversarial scheme, between public defense and private defense.

Likewise, Rengifo et al. (2019, p. 590) highlights how, in the United States, issues in the criminal field, related to control or preliminary hearings, are undertaken with the unrestricted use of statistics to reach important conclusions. By way of illustration, he mentions examples in which the statistical discipline was unavoidable. Namely: it was determined on the basis of multivariate approximations that pre-trial detainees have a higher probability of being convicted; indictments with a higher number of charges tend to result in longer sentences; certain "legal" and "extralegal" factors of the cases are related to the specific decisions made in preliminary hearings.

Likewise, in official cases in New Jersey, using models with Bayes estimators for unconditional release orders, it was found that people of African-American or Latino

origin have a lower probability of receiving this type of decision; in Ohio, using official microdata, a Logit model was implemented to estimate the incidence, in defendants with unconditional release decisions, of demographic, ethnic, racial, gender and educational level aspects, in correlation with the seriousness of the offenses charged. The application of multivariate methods showed how cases involving more severe crimes reduce the probability of unconditional release orders and increase the value of economic bonds; defendants with private defense attorneys receive more favorable decisions during the initial investigation, among many other legal research studies.

Elaborating, he comments:

"...it is argued that statistics in law would be very useful, for example, in the development of a database for the Judiciary, which among other services can offer the possibility of a system of Statistical Quality Control of Judicial Decisions, which allows to show the frequency of: i) Changes in jurisprudential lines, ii) Decisions with lack of motivation, iii) Revocation of judgments according to territory, subject matter, etc. Thus, the application of statistics in the legal venue can be a fantastic tool to improve the administration of justice, fight corruption and finally, even promote the evolution of our legal systems at a new pace and demand that the 21st century imposes on us with such forceful technological advances. In this sense, although it is true that statistics are being used (although limitedly) in the Judicial Power, Public Registries, among others, we are of the opinion that they should also be used, completely and integrally, in law firms, in order to determine, for example, the months and days in which there is a greater or lesser number of sponsored clients, as well as the income from consultations. The same applies to notary offices" (Rica et al., 2005, p. 17).

DISCUSSION

It is perfectly appreciable that, the increase of the statistical need in the daily life of the litigant lawyer and in the research is evident, and it is enough to observe that there is no essay, article or legal research that does not include in its content aspects such as: the realization of a survey, the design of a sample, the preparation of graphs, analysis of measures of central tendency, correlation or determination coefficients. It is then clear that statistical preparation is unavoidable in the legal university environment, in light of the fact that, without any consideration, the mastery of statistical techniques and instruments is a true investigative competence of urgent reinforcement, both in research professors and in law students, to the clamor that the latter will always be called to participate with the professors in all kinds of investigations. In spite of the above, there is no hint in Latin American law schools of the training required in this area, so it is important that universities begin to contemplate the introduction of the subject "statistics" in the law career, so that, in the exercise of their profession, lawyers can achieve greater efficiency in their performance, even more so, if their natural space will be teaching and, as a consequence, research. This challenge must be assumed in a formal

manner, aiming to overcome the paradigm that the jurist should only be trained in the domain of reading, logic, argumentation, dogmatics, doctrine and jurisprudence.

CONCLUSIONS

Thus, the aforementioned requirement must be established as a research competence and a necessary condition for undertaking projects that contemplate data management. However, we are aware that overcoming tradition and the secular approach is somewhat complicated, but, if we do not start as soon as possible, it will be increasingly difficult to achieve the goal. Fighting the disdain and prejudice of lawyers about handling "numbers" is uphill but not impossible.

The cases cited in the previous paragraph, as a sample, are faithful proof of the need to which we refer and we would not have enough books to demonstrate how the proper use of the statistical discipline is the one that gives robustness to projects that require the collection, processing, analysis and presentation of research results. On the contrary, from personal experience, we have witnessed how considerable efforts of professionals engaged in research work have failed, for example, by not taking into account the sampling technique when collecting information from a given population or universe. As a consequence, the inferences are totally invalid because the methodology does not present the due procedure related to the sample design.

The same fate has befallen many studies that, due to lack of knowledge on the part of their directors, have avoided the unequivocal step of designing a good data collection instrument, which is why, in spite of having undertaken all the steps of statistical research, they failed simply because they did not formulate the questions that should have underpinned the output tables designed, or because they were poorly written.

These comments are therefore necessary to promote a clear awareness among law professionals, as well as among university authorities, of the need to expand it to all careers in which statistics are absent.

It is important to emphasize that scientific research is only learned in the practice of research, that is, it is learned by doing research. There is no other way to be a researcher than doing research. That is why it is so important in university education to have research tutors, so that with their experience they can guide students in the development of research skills, showing them clearly the path to follow, as well as their convictions and positive attitudes towards science, sharing with their students the benefits of rigorous work towards scientific knowledge, a condition that is achieved through the use of applied statistical methods and tools. The researcher must have epistemic and methodological, theoretical and practical training; he/she must also cultivate a reflective attitude, critical and divergent thinking, as well as the ability to reason. Possess intellectual honesty, be broad and respectful of other opinions and act with independence of judgment. Conditions that favor research competencies in our students and prepare them with a different view of the problems of professional reality, to explore it and influence its transformation.

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