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Leading article

Statistical culture as a quality of the educational researcher

La cultura estadística como cualidad del investigador educativo

A cultura estatística como qualidade do pesquisador educacional

Carlos Luis Fernández Peña¹



<https://orcid.org/0000-0001-6833-0055>

Benito Bravo Echevarría¹



<https://orcid.org/0000-0002-1395-1855>

¹University of Pinar del Río "Hermanos Saíz Montes de Oca". Pinar del Río, Cuba.



carlosl.fernandez@upr.edu.cu;
benito.bravp@upr.edu.cu

In the constant pursuit of improving the quality of educational research, we invite our readers to reflect on the importance of statistics as a fundamental tool in the research process. Science goes beyond theoretical knowledge; it requires the constant confrontation of theoretical formulations with objective reality through

observations and experiments. Proper management of quantitative data is crucial to ensure the validity of our research and, consequently, to enhance educational practices.

When managing the research process, it is essential to understand that science does not end with theoretical knowledge. It must continuously test its theoretical formulations against objective reality through observations and experiments. Empirical activity plays a vital role here, providing the data that either supports or refutes the truth of hypotheses posed in research.

In empirical work based on quantitative data, researchers must master statistics to correctly obtain, process, and communicate quantitative information. This prevents conceptual, procedural, or perceptual errors regarding the necessity of appropriate data for each specific situation.

Statistics offers methods, techniques, and procedures for handling data, organizing, presenting, describing, analyzing, and interpreting it. These contributions aid the scientific study of educational issues, contribute to acquiring knowledge about educational realities, guide decision-making, and improve practices in the educational field.

This emphasis arises because, too often, we encounter research that misuses data without respecting their conceptual distinctions. For instance, some studies use variables with scales inappropriate for the situation they attempt to describe. Similarly, there are cases where percentages are inappropriately applied to qualitative data or where averages are calculated where no numeric data exist, among other issues.

Furthermore, the use of statistics often faces resistance due to individual or collective beliefs about its complexity, or the manipulation of data to reach conclusions unsupported by practice, which gives statistics a bad reputation. This undervaluation leads many researchers to

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consider statistics as minor, violating basic precepts in statistical research design. In reality, the fear or misrepresentation of statistics does not arise from the discipline itself but from potential gaps in knowledge or misuse by those who apply it with ulterior motives.

The role of statistics in educational research is universally recognized, as evidenced by the attention it receives in works by various authors. Educational researchers are not merely users of data but also producers of statistical information. They need to seek, process, represent, and communicate this information through visual means such as graphs, tables, percentages, averages, correlations, models, or other descriptive measures derived from samples, populations, or randomized experiments. Hence, promoting a culture of statistics among educational researchers is essential.

The editorial stance presented here highlights the importance of statistical culture in educational research, emphasizing its relevance and components. The aim is to draw attention to this topic and encourage actions that support its development as part of the training processes of future researchers.

Statistical culture is a globally relevant topic, discussed in forums like the International Statistical Institute and Inter-American Conferences on the Teaching of Statistics. These forums emphasize not only technical mastery of statistical tools but also an understanding of statistics as a culture for interpreting collective phenomena. Many authors identify three components of this culture: the ability to critically evaluate information, communicate effectively, and appreciate the contributions of statistical reasoning.

In educational research, statistical culture includes specific components. First, the attitude towards statistics as an essential resource for processing quantitative empirical information. A statistically literate researcher values statistics as a problem-solving tool, finding satisfaction in its rigor and committing to data accuracy,

avoiding any form of manipulation. Second, the perception of the need for data becomes crucial from the problem formulation stage and hypothesis setting. This perception ensures that the researcher selects relevant data, applies appropriate statistical methods, and uses meta-analysis techniques to interpret previous research, thus achieving coherence in the research process.

Another essential component is proficiency in transnumeration tools, which transform raw data into meaningful information. This process is fundamental in statistical analysis, allowing data to be converted into representations that support decision-making and hypothesis validation. In this context, statistical software like SPSS has become valuable, particularly in Cuba, where its low computational requirements make it accessible and versatile for quantitative analysis.

Statistics is also fundamental in research design, both for controlling variables in experiments and for sampling and analysis. It provides solid criteria for ensuring internal and external validity, for example, through techniques like covariance analysis and random sampling, which control extraneous variables.

Finally, a critical attitude is a distinguishing feature of statistical culture in educational researchers, who must interpret and question statistical information, identify potential biases, and provide well-founded arguments. This critical stance ensures that researchers not only interpret data but also assess the reliability and rigor of statistical arguments, thereby strengthening the quality and accuracy of their conclusions.

Aligned with the principles of open science, Mendive reaffirms its commitment to fostering a rigorous and transparent statistical culture. The importance of this culture is evident in the current context, where the proper interpretation and ethical handling of statistical data are essential for advancing scientific knowledge and making informed decisions. Open science,

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emphasizing accessibility and reproducibility of results, promotes practices that ensure the truthfulness and reliability of data. In this framework, it supports not only the visibility of research based on solid statistical analyses but

also the development of critical skills that enable researchers and readers to understand and question statistical information, thus contributing to a more ethical and responsible academic environment.

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The authors declare not to have any interest conflicts.

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The authors participated in the design and writing of the leading article.



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